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Distribution of Fishes in U.S. Streams Tributary to Lake Superior

By Harry H. Moore and Robert A. Braem

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UNITED STATES DEPARTMENT OF THE INTERIOR
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United States Fish and Wildlife Service
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Distribution of Fishes in U.S. Streams Tributary to Lake Superior

By

HARRY H. MOORE and ROBERT A. BRAEM

ABSTRACT

Experimental sea lamprey control by the Bureau of Commercial Fisheries on Lake Superior streams provided many new distributional records of the fish fauna. Seventy-one species were recorded from 175 streams. Specimens were collected at the electromechanical barriers, with electric shockers, with fyke nets, and during chemical treatment of streams.

Maps showing stream records of each species are presented.

INTRODUCTION

Research by the Bureau of Commercial Fisheries, under contract with the Great Lakes Fishery Commission, to control the sea lamprey, Petromyzon marinus Linnaeus, provided the opportunity to add to the knowledge of the fish fauna of Lake Superior tributaries. This report contains data on species records from streams that enter Lake Superior in Michigan, Wisconsin, and Minnesota. Collections of biological and rheological data have been carried on since 1950 when a mechanical weir was constructed on Pendills Creek, Chippewa County, Mich. (Applegate and Smith, 1950).

Common and scientific names are those published by the American Fisheries Society (1960). Each species in this report is referred to by number. The species number, scientific and common names, and page number of distributional maps of the fishes follow:

Petromyzontidae:
1. Ichthyomyzon unicuspis Hubbs and Trautman, silver lamprey (adult), p. 10
2. Ichthyomyzon fossor Reighard and Cummins, northern brook lamprey (adult), p. 11

2D. Ichthyomyzon sp., silver and northern brook lampreys (ammocetes), p. 12
3. Petromyzon marinus Linnaeus, sea lamprey, p. 13
4. Lampetra lamottei (Lesueur), American brook lamprey, p. 14

Acipenseridae:
5. Acipenser fulvescens Rafinesque, lake sturgeon, p. 15

Lepisosteidae:
6. Lepisosteus osseus (Linnaeus), long-nose gar, p. 15

Amiidae:
7. Amia calva Linnaeus, bowfin, p. 15

Clupeidae:
8. Alosa pseudoharengus (Wilson), alewife, p. 15

Salmonidae:
9. Salmo trutta Linnaeus, brown trout, p. 16
10. Salmo gairdneri Richardson, rainbow trout, p. 17
11. Oncorhynchus gorbuscha (Walbaum), pink salmon. p. 18
12. Salvelinus fontinalis (Mitchill), brook trout, p. 19
13. Salvelinus namaycush (Walbaum), lake trout, p. 18
14. Coregonus artedii Lesueur, lake herring, p. 18
15. Prosopium cylindraceum (Pallas), round whitefish, p. 18

Osmeridae:
16. Osmerus mordax (Mitchill), American smelt, p. 20

Umbridae:
17. Umbra limi (Kirtland), central mudminnow, p. 21

Esocidae:
18. Esox lucius Linnaeus, northern pike, p. 22
19. Exos masquinongy Mitchill, muskellunge, p. 22

Cyprinidae:
20. Cyprinus carpio Linnaeus, carp, p. 23
21. Semotilus atromaculatus (Mitchill), creek chub, p. 24
22. Semotilus margarita (Cope), pearl dace, p. 23

Note.--Harry H. Moore, Fishery Biologist (General), and Robert A. Braem, Fishery Biologist (General), Bureau of Commercial Fisheries, Ann Arbor, Mich.

23. Hybopsis plumbea (Agassiz), lake chub, p. 25
24. Hybopsis biguttata (Kirtland), hornyhead chub, p. 26
25. Rhinichthys atratulus (Hermann), blacknose dace, p. 27
26. Rhinichthys cataractae (Valenciennes), longnose dace, p. 28
27. Chrosomus neogaeus (Cope), finescale dace, p. 29
28. Chrosomus eos Cope, northern redbelly dace, p. 30
29. Notemigonus crysoleucas (Mitchill), golden shiner, p. 31
30. Notropis atherinoides Rafinesque, emerald shiner, p. 32
31. Notropis rubellus (Agassiz), rosyface shiner, p. 32
32. Notropis cornutus (Mitchill), common shiner, p. 33
33. Notropis hudsonius (Clinton), spottail shiner, p. 34
34. Notropis heterodon (Cope), blackchin shiner, p. 35
35. Notropis dorsalis (Agassiz), bigmouth shiner, p. 35
36. Notropis stramineus (Cope), sand shiner, p. 36
37. Notropis volucellus (Cope), mimic shiner, p. 35
38. Notropis heterolepis Eigenmann and Eigenmann, blacknose shiner, p. 37
39. Hybognathus hankinsoni Hubbs, brassy minnow, p. 38
40. Pimephales promelas Rafinesque, fathead minnow, p. 39
41. Pimephales notatus (Rafinesque), bluntnose minnow, p. 40

Catostomidae:

42. Catostomus commersoni (Lacépède), white sucker, p. 41
43. Catostomus catostomus (Forster), longnose sucker, p. 42
44. Moxostoma anisurum (Rafinesque), silver redhorse, p. 43
45. Moxostoma macrolepidotum (Lesueur), northern redhorse, p. 43

Ictaluridae:

46. Ictalurus punctatus (Rafinesque), channel catfish, p. 44
47. Ictalurus melas (Rafinesque), black bullhead, p. 45
48. Ictalurus nebulosus (Lesueur), brown bullhead, p. 46
49. Ictalurus natalis (Lesueur), yellow bullhead, p. 44
50. Noturus flavus Rafinesque, stonecat, p. 44
51. Noturus gyrinus (Mitchill), tadpole madtom, p. 44

Anguillidae:

52. Anguilla rostrata (Lesueur), American eel, p. 47

Cyprinodontidae:

53. Fundulus diaphanus (Lesueur), banded killifish, p. 47

Gadidae:

54. Lota lota (Linnaeus), burbot, p. 47

Gasterosteidae:

55. Eucalia inconstans (Kirtland), brook stickleback, p. 48
56. Pungitius pungitius (Linnaeus), ninespine stickleback, p. 49

Percopsidae:

57. Percopsis omiscomaycus (Walbaum), trout-perch, p. 50

Centrarchidae:

58. Micropterus dolomieui Lacépède, smallmouth bass, p. 51
59. Micropterus salmoides (Lacépède), largemouth bass, p. 51
60. Lepomis gibbosus (Linnaeus), pumpkinseed, p. 52
61. Lepomis macrochirus Rafinesque, bluegill, p. 52
62. Ambloplites rupestris (Rafinesque), rock bass, p. 53
63. Pomoxis nigromaculatus (Lesueur), black crappie, p. 53

Percidae:

64. Perca flavescens (Mitchill), yellow perch, p. 54
65. Stizostedion vitreum vitreum (Mitchill), walleye, p. 55
66. Percina maculata (Girard), blackside darter, p. 55
67. Percina caprodes (Rafinesque), logperch, p. 56
68. Etheostoma nigrum Rafinesque, Johnny darter, p. 57
69. Etheostoma exile (Girard), Iowa darter, p. 58

Cottidae:

70. Cottus bairdi Girard, mottled sculpin, p. 59
71. Cottus cognatus Richardson, slimy sculpin, p. 60

METHODS OF COLLECTION

Fish collections were made incidentally to four phases of the experimental sea lamprey control program: the operation of electric barriers; distribution surveys for sea lamprey ammocetes; fishing of fyke nets for larval and transforming sea lampreys; and, the application of selective sea lamprey larvicides.

ELECTRIC BARRIERS

Electric barriers with traps have been operated on 60 streams of Lake Superior to block the spawning migration of sea lampreys. The system of barriers extended from the Waiska River, near Sault Ste. Marie, Mich.,

to the Nemadji River at Superior, Wis. The operation of the barriers was described by Erkkila, Smith, and McLain (1956). The traps at each barrier are framed with wood and enclosed with 1/2-inch mesh galvanized iron hardware cloth. No facilities were maintained to capture fish moving down stream. We have used many records of fish collected at these barriers. Because weirs were not operated along the Minnesota shore, collections there were limited to fish stunned by electric shockers and fish unavoidably killed by lamprey larvicides.

ELECTRIC SHOCKERS

Surveys to determine the presence and distribution of sea lampreys in streams tributary to Lake Superior were made with electric shockers, developed exclusively for collecting ammocetes (Braem and Ebel, 1961). The electric power available from these units limits their effectiveness for collecting but many fish were taken. Streams containing sea lamprey larvae are surveyed intensively; consequently, fish collections are more representative for these streams.

FYKE NETS

Fyke nets have been fished on selected streams to provide information on larval and newly metamorphosed sea lampreys. The nets are constructed of 1/4-inch-bar synthetic netting with a screen liner (18 by 14 openings to the square inch). Large numbers of small fish are taken by fyke nets.

CHEMICAL TREATMENTS

Chemical treatment of streams (tributary to Lake Superior) has resulted in mortality of some fish other than lamprey (Applegate and King, 1962). Weaker members of most fish species succumb to the lampricide. Representative samples of fish are collected from each stream during chemical treatment.

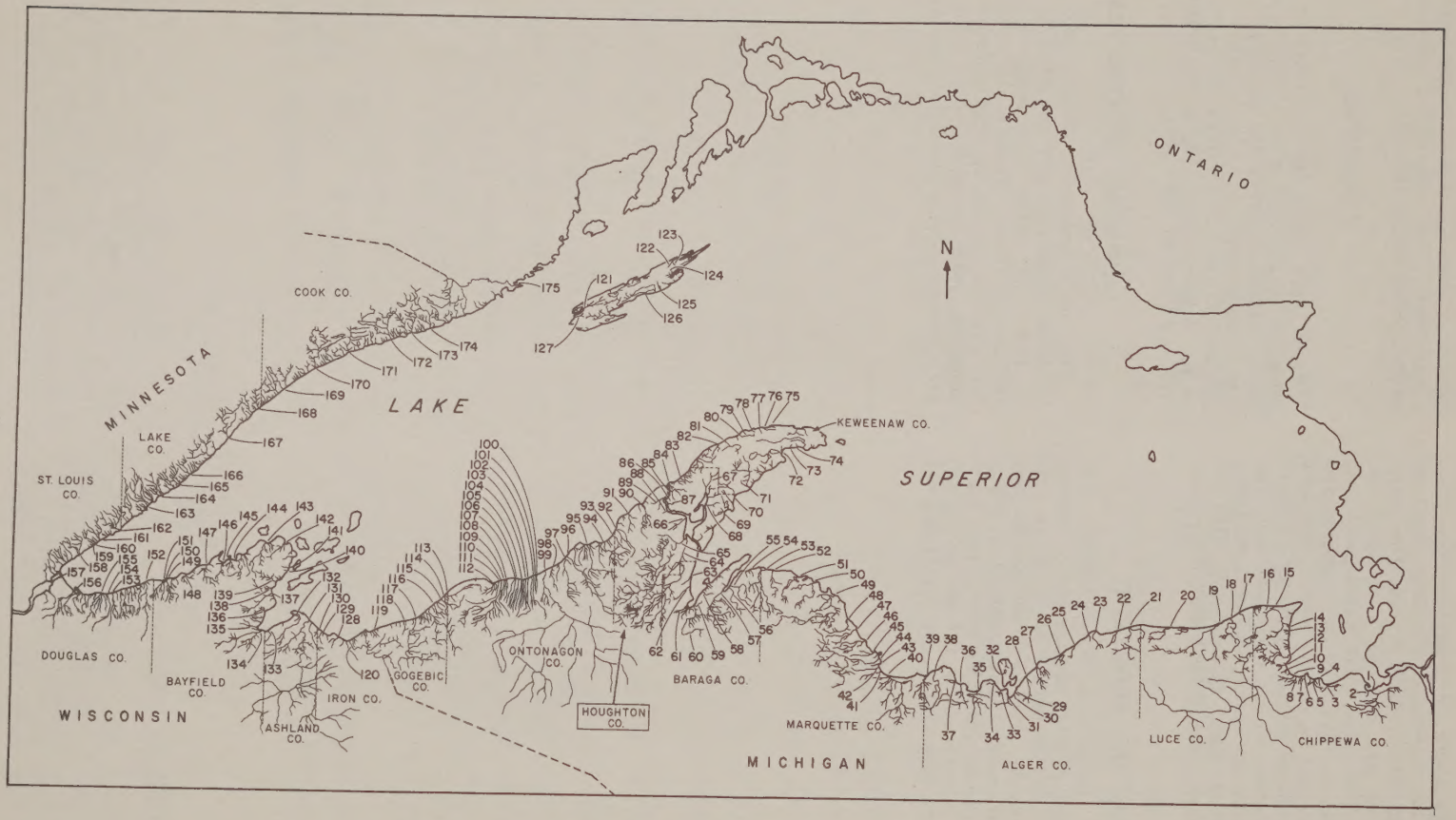

Figure 1.--Location of Lake Superior streams where fish were collected.

STREAMS, THEIR GEOGRAPHICAL LOCATION AND SPECIES COLLECTED

Collections of fishes were made from 175 Lake Superior tributaries (Figure 1). Each stream is numbered, and this number is used to identify the stream in the text.

Records for species are given by state, county, and stream; included is the geographical location of the stream mouth, designated by township (T.), range (R.) and section (sec.). The asterisks designate the streams where electromechanical barriers were operated.

MICHIGAN

Alger County

*21. Sucker River, T. 49 N., R. 13 W., sec. 4. Species: 3, 4, 8, 10, 12, 15, 16, 17, 18, 21, 25, 26, 28, 29, 32, 33, 39, 40, 41, 42, 43, 48, 54, 55, 56, 57, 58, 62, 64, 67, 68, 70, 71.

22. Sable Creek, T. 49 N., R. 14 W., sec. 2. Species: 3, 10, 16, 25, 26, 42, 58, 62.

*23. Hurricane River, T. 49 N., R. 15 W., sec. 3. Species: 3, 4, 10, 12, 26, 42, 43.

24. Sullivan Creek, T. 49 N., R. 15 W., sec. 9. Species: 3, 4, 10, 12.

25. Seven Mile Creek, T. 49 N., R. 16 W., sec. 25. Species: 3, 4, 10, 12.

*26. Beaver Lake Creek, T. 48 N., R. 16 W., sec. 7. Species: 3, 4, 10, 12, 15, 16, 17, 18, 20, 25, 26, 28, 32, 33, 41, 42, 43, 47, 52, 57, 61, 62, 64, 67, 68, 69, 70.

27. Mosquito River, T. 48 N., R. 18 W., sec. 25. Species: 3, 4, 10, 12, 25.

*28. Miners River, T. 47 N., R. 18 W., sec. 3. Species: 3, 4, 10, 12, 16, 18, 21, 25, 26, 28, 32, 38, 42, 43, 54, 56, 70, 71.

29. Munising Falls Creek, T. 47 N., R. 19 W., sec. 36. Species: 3, 4, 10, 12, 21, 23, 42, 54.

30. Tannery Falls Creek, T. 46 N., R. 19 W., sec. 1. Species: 4, 10, 12.

31. Anna River, T. 46 N., R. 19 W., sec. 2. Species: 3, 4, 9, 10, 12, 33, 42, 56, 70, 71.

32. Echo Lake Creek, T. 47 N., R. 19 W., sec. 4. Species: 25, 38, 42.

*33. Furnace Creek, T. 47 N., R. 19 W., sec. 29. Species: 1, 3, 4, 10, 12, 16, 17, 18, 21, 22, 25, 26, 27, 28, 29, 32, 33, 38, 39, 42, 43, 48, 54, 55, 56, 57, 58, 59, 60, 62, 64, 65, 67, 68, 69, 70.

34. Five Mile Creek, T. 47 N., R. 19 W., sec. 18. Species: 3, 4, 10, 12, 16, 17, 55, 70.

*35. Au Train River, T. 47 N., R. 20 W., sec. 29. Species: 1, 2D, 3, 4, 10, 12, 16, 17, 18, 20, 21, 24, 25, 26, 27, 28, 29, 32, 33, 34, 37, 41, 42, 43, 47, 48, 54, 55, 57, 58, 59, 60, 62, 64, 65, 67, 68, 69, 70.

*36. Rock River, T. 47 N., R. 21 W., sec. 15. Species: 3, 4, 10, 12, 16, 17, 18, 21, 24, 25, 26, 28, 32, 41, 42, 43, 55, 64, 69, 70.

37. Deer Lake Creek, T. 47 N., R. 21 W., sec. 16. Species: 3, 10, 16, 21, 25, 27, 28, 32, 42, 48, 61, 68, 69, 70.

*38. Laughing Whitefish River, T. 48 N., R. 22 W., sec. 26. Species: 2D, 3, 4, 10, 12, 16, 17, 18, 21, 22, 24, 25, 26, 32, 33, 42, 43, 48, 54, 57, 62, 64, 67, 70.

*39. Sand River, T. 47 N., R. 22 W., sec. 6. Species: 3, 9, 10, 12, 16, 17, 21, 25, 26, 32, 40, 42, 43, 54, 55, 68, 70.

Baraga County

54. Gulskog Creek, T. 52 N., R. 30 W., sec. 17. Species: 10, 21.

*55. Ravine River, T. 51 N., R. 31 W., sec. 4. Species: 1, 2, 2D, 3, 10, 12, 16, 21, 22, 25, 26, 27, 28, 32, 33, 38, 39, 40, 42, 43, 47, 54, 55, 57, 62, 64, 67, 68, 70.

*56. Slate River, T. 51 N., R. 31 W., sec. 8. Species: 2D, 3, 10, 12, 16, 21, 25, 26, 28, 32, 42, 43, 55, 57, 67, 68, 70.

*57. Silver River, T. 51 N., R. 31 W., sec. 18. Species: 1, 2, 2D, 3, 8, 9, 10, 12, 14, 16, 17, 18, 21, 22, 23, 25, 26, 27, 28, 29, 32, 33, 39, 40, 42, 43, 47, 48, 54, 55, 56, 57, 58, 60, 62, 64, 65, 67, 68, 70.

58. Little Silver Creek, T. 51 N., R. 32 W., sec. 18. Species: 10.

59. Meadow Brook, T. 50 N., R. 33 W., sec. 5. Species: 9, 10.

60. Falls River, T. 50 N., R. 33 W., sec. 5. Species: 2D, 3, 8, 9, 10, 42, 70.

61. Six Mile Creek, T. 50 N., R. 34 W., sec. 1. Species: 2D, 3, 12, 17, 55.

62. Little Carp River, T. 51 N., R. 33 W., sec. 10. Species: 10, 17, 28, 55.

63. Kelsey Creek, T. 52 N., R. 33 W., sec. 27. Species: 10, 12.

Chippewa County

*1. Waiska River, T. 46 N., R. 2 W., sec. 5. Species: 1, 2D, 3, 4, 8, 10, 12, 16, 17, 18, 21, 22, 25, 26, 27, 28, 29, 30, 32, 34, 36, 38, 39, 40, 41, 42, 43, 44, 48, 54, 55, 56, 57, 60, 61, 62, 64, 65, 67, 68, 69, 70, 71.

2. Little Waiska Creek, T. 46 N., R. 2 W., sec. 5. Species: 4, 16, 21, 25, 32, 36, 68, 70.

*3. Pendills Creek, T. 47 N., R. 4 W., sec. 28. Species: 1, 2D, 3, 4, 9, 10, 12, 13, 16, 18, 26, 28, 32, 39, 40, 42, 43, 48, 53, 54, 55, 56, 57, 62, 64, 67, 69, 70.

4. Grants Creek, T. 47 N., R. 5 W., sec. 13. Species: 3, 4, 10, 12, 17.

*5. Halfaday Creek, T. 47 N., R. 5 W., sec. 14. Species: 3, 4, 10, 12, 16, 26, 42, 43, 54, 55, 70, 71.

6. Mill Creek, T. 47 N., R. 5 W., sec. 15. Species: 4, 9, 10, 12, 70.

7. Naomikong Creek, T. 47 N., R. 5 W., sec. 7. Species: 3, 4, 10, 12, 26, 68.
*8. Ankodosh Creek, T. 47 N., R. 6 W., sec. 12. Species: 3, 4, 10, 12, 21, 26, 38, 41, 42.
9. Roxbury Creek, T. 47 N., R. 6 W., sec. 11. Species: 4, 10, 12, 71.
10. Big Silver Creek, T. 47 N., R. 6 W., sec. 3. Species: 4, 12, 17.
11. Galloway Creek, T. 48 N., R. 6 W., sec. 28. Species: 3, 4, 12, 16, 17, 27, 69.
12. Tahquamenon River, T. 48 N., R. 6 W., sec. 14. Species: 2, 2D, 3, 4, 10, 12, 16, 17, 18, 21, 22, 26, 27, 28, 29, 30, 31, 32, 33, 36, 37, 38, 40, 41, 42, 43, 44, 47, 48, 55, 57, 58, 62, 64, 66, 67, 68, 69, 70.
13. O'Briens Creek, T. 49 N., R. 6 W., sec. 22. Species: 4, 12, 17, 22, 25, 28, 38, 42, 55, 70.
*14. Betsy River, T. 49 N., R. 6 W., sec. 2. Species: 1, 2, 2D, 3, 4, 10, 12, 16, 17, 18, 21, 22, 25, 26, 27, 28, 29, 30, 32, 33, 34, 36, 37, 38, 39, 40, 41, 42, 43, 48, 54, 55, 56, 57, 60, 62, 64, 66, 67, 68, 70, 71.
15. Weatherhog Creek, T. 50 N., R. 7 W., sec. 1. Species: 4.
16. Vermilion Creek, T. 50 N., R. 7 W., sec. 2. Species: 4, 17, 27, 28, 38, 41, 69.

Gogebic County

114. Little Carp River, T. 50 N., R. 45 W., sec. 2. Species: 71.
115. Tiebel Creek, T. 50 N., R. 45 W., sec. 16. Species: 12.
116. Speaker Creek, T. 50 N., R. 45 W., sec. 16. Species: 12.
117. Black River, T. 49 N., R. 46 W., sec. 3. Species: 2D, 21.
118. Maple Creek, T. 49 N., R. 47 W., sec. 12. Species: 10, 12.
119. Little Speckled Creek, T. 49 N., R. 48 W., sec. 27. Species: 10, 12.
120. Montreal River, T. 48 N., R. 49 W., sec. 10. Species: 17, 21, 25, 26, 42, 54, 58, 68.

Houghton County

*64. Sturgeon River, T. 54 N., R. 33 W., sec. 33. Species: 1, 2, 2D, 3, 5, 9, 10, 12, 16, 17, 18, 20, 21, 23, 25, 26, 28, 29, 30, 32, 33, 35, 36, 38, 40, 42, 43, 44, 45, 47, 48, 54, 55, 57, 58, 59, 60, 61, 62, 63, 64, 65, 67, 68, 69.
65. Pike River, T. 53 N., R. 33 W., sec. 5. Species: 1, 2, 2D, 9, 10, 12.
*66. Pilgrim River, T. 54 N., R. 33 W., sec. 5. Species: 2D, 3, 9, 10, 12, 16, 18, 21, 26, 33, 42, 54, 57, 58, 61, 64, 67, 68, 70.
*67. Traprock River, T. 55 N., R. 32 W., sec. 5. Species: 2D, 10, 12, 16, 20, 25, 26, 32, 33, 42, 43, 54, 57, 62, 64, 67.
68. McCallum Creek, T. 55 N., R. 32 W., sec. 18. Species: 3, 20, 67.
69. Mud Lake Outlet, T. 55 N., R. 31 W., sec. 20. Species: 2D, 3, 10, 12, 17, 18, 25, 32, 55, 62, 68, 69.
*70. Traverse River, T. 55 N., R. 31 W., sec. 4. Species: 1, 2, 2D, 3, 8, 10, 12, 16, 17, 18, 21, 25, 26, 32, 42, 43, 54, 55, 57, 62, 64, 67, 70.
83. McGunn's Creek, T. 56 N., R. 34 W., sec. 12. Species: 9, 10, 12.
84. Smith Creek, T. 56 N., R. 34 W., sec. 14. Species: 3, 10, 12.
*85. Boston-Lily Creek, T. 56 N., R. 34 W., sec. 33. Species: 2D, 3, 10, 12, 16, 18, 26, 42, 54, 55, 57, 64, 67.
86. Creek No. 1, T. 55 N., R. 34 W., sec. 35. Species: 12.
87. Lake Annie Outlet, T. 55 N., R. 34 W., sec. 4. Species: 10, 12.
88. Coles Creek, T. 55 N., R. 34 W., sec. 28. Species: 10, 12,
*89. Schlotz Creek, T. 55 N., R. 34 W., sec. 8. Species: 10, 12, 16, 26, 42, 54, 57, 67, 71.
90. Salmon Trout River, T. 55 N., R. 35 W., sec. 20. Species: 2D, 3, 12.
*91. Graveraet River, T. 55 N., R. 36 W., sec. 35. Species: 3, 10, 12, 26, 42, 54.
*92. Elm River, T. 54 N., R. 36 W., sec. 30. Species: 1, 2D, 3, 10, 12, 16, 21, 26, 32, 42, 43, 47, 54, 55, 56, 60, 68.
93. Little Elm River, T. 54 N., R. 36 W., sec. 31. Species: 10, 12, 32.

Keweenaw County (Isle Royale streams 121-127)

*71. Tobacco River, T. 56 N., R. 30 W., sec. 20. Species: 2, 2D, 10, 12, 16, 26, 42, 43.
*72. Little Gratiot River, T. 58 N., R. 29 W., sec. 31. Species: 1, 2, 2D, 3, 10, 12, 16, 17, 18, 21, 26, 32, 33, 42, 43, 54, 57, 58, 62, 64, 65, 67, 69.
73. Bear Creek, T. 58 N., R. 28 W., sec. 30. Species: 10, 16.
74. Montreal River, T. 58 N., R. 28 W., sec. 27. Species: 12, 17, 21, 25, 26, 42, 54, 58, 68.
75. Glazon Creek, T. 59 N., R. 29 W., sec. 31. Species: 12.
76. Silver River, T. 59 N., R. 30 W., sec. 35. Species: 10, 12.
77. Eliza Creek, T. 58 N., R. 30 W., sec. 6. Species: 2D, 3, 10, 12, 21, 26, 42, 54, 55, 70.
78. Jacobs Creek, T. 58 N., R. 31 W., sec. 16. Species: 12.
79. Garden City Brook, T. 58 N., R. 31 W., sec. 18. Species: 10, 12.
80. Eagle River, T. 58 N., R. 32 W., sec. 24. Species: 23.
*81. Gratiot River, T. 47 N., R. 33 W., sec. 11. Species: 1, 2D, 3, 9, 10, 12, 21, 26, 32, 42, 43, 54, 57, 62, 67.

82. Hill Creek, T. 57 N., R. 33 W., sec. 14. Species: 23, 42.
121. Washington Creek, T. 64 N., R. 38 W., sec. 29. Species: 3, 10, 12.
122. Chickenbone Lake Creek, T. 66 N., R. 35 W., sec. 26. Species: 12, 26, 42, 70.
123. Sargent Lake Creek, T. 66 N., R. 35 W., sec. 26. Species: 12, 26, 70.
124. Benson Creek, T. 66 N., R. 34 W., sec. 22. Species: 12.
125. Lake Richie Creek, T. 65 N., R. 34 W., sec. 18. Species: 26, 42, 64, 70, 71.
126. Siskiwit Lake Outlet, T. 65 N., R. 35 W., sec. 31. Species: 23, 26, 42, 71.
127. Grace Creek, T. 63 N., R. 39 W., sec. 1. Species: 10, 12, 23, 26, 42, 55.

Luce County

17. Three Mile Creek, T. 50 N., R. 8 W., sec. 16. Species: 3, 4, 10, 12.
*18. Little Two Hearted River, T. 50 N., R. 9 W., sec. 24. Species: 3, 4, 10, 12, 15, 16, 17, 18, 21, 22, 25, 26, 29, 32, 36, 38, 39, 42, 43, 48, 54, 57, 59, 62, 64, 67, 68, 70, 71.
*19. Two Hearted River, T. 50 N., R. 9 W., sec. 27. Species: 1, 3, 4, 9, 10, 12, 15, 16, 17, 18, 21, 22, 23, 25, 26, 27, 28, 29, 30, 32, 33, 34, 38, 39, 40, 41, 42, 43, 47, 48, 54, 55, 56, 57, 59, 60, 62, 64, 67, 68, 69, 70, 71.
*20. Dead Sucker River, T. 50 N., R. 11 W., sec. 33. Species: 3, 10, 12, 15, 16, 17, 18, 21, 25, 26, 29, 34, 38, 40, 42, 54, 62, 64, 68, 71.

Marquette County

*40. Chocolay River, T. 47 N., R. 24 W., sec. 6. Species: 1, 2, 2D, 3, 4, 9, 10, 12, 13, 16, 17, 18, 21, 22, 25, 26, 27, 28, 29, 30, 32, 33, 39, 40, 42, 43, 47, 48, 54, 55, 56, 60, 61, 62, 64, 67, 69, 70, 71.
*41. Carp River, T. 48 N., R. 25 W., sec. 36. Species: 2D, 3, 4, 9, 10, 12, 16, 20, 26, 29, 32, 42, 43, 55, 56, 62, 64, 67, 71.
42. Deertrack Creek, T. 48 N., R. 25 W., sec. 26. Species: 10, 12, 26.
43. Shiras Hill Creek, T. 48 N., R. 25 W., sec. 23. Species: 9, 10, 12.
44. Dead River, T. 48 N., R. 25 W., sec. 11. Species: 2D, 3, 9, 10, 12, 16, 18, 32, 42, 43, 56, 58, 62, 64, 65.
45. Compeau Creek, T. 48 N., R. 25 W., sec. 3. Species: 12.
*46. Harlow Creek, T. 49 N., R. 25 W., sec. 20. Species: 1, 2, 2D, 3, 4, 10, 12, 16, 18, 21, 22, 26, 27, 28, 32, 42, 43, 47, 48, 54, 55, 56, 58, 61, 62, 64, 65, 67, 68, 70, 71.
*47. Little Garlic River, T. 49 N., R. 26 W., sec. 2. Species: 3, 10, 12, 16, 26, 32, 42, 43, 55, 67, 68, 70.
*48. Big Garlic River, T. 50 N., R. 26 W., sec. 21. Species: 3, 4, 10, 12, 16, 18, 20, 21, 22, 23, 26, 32, 33, 36, 42, 43, 48, 55, 59, 62, 64, 65, 67, 68, 69, 71.
*49. Iron River, T. 51 N., R. 26 W., sec. 18. Species: 1, 2, 2D, 3, 9, 10, 12, 14, 16, 17, 18, 20, 21, 25, 26, 27, 29, 30, 32, 33, 34, 37, 38, 39, 40, 41, 42, 43, 48, 54, 55, 56, 57, 58, 60, 62, 64, 65, 67, 68, 69, 70.
*50. Salmon Trout River, T. 52 N., R. 27 W., sec. 31. Species: 1, 2, 2D, 3, 10, 12, 16, 17, 21, 22, 25, 26, 27, 28, 29, 32, 42, 43, 54, 55, 56, 57, 62, 64, 67, 68, 70.
*51. Pine River, T. 52 N., R. 28 W., sec. 21. Species: 1, 2, 2D, 3, 10, 12, 16, 17, 18, 21, 23, 26, 27, 28, 32, 33, 37, 38, 39, 40, 41, 42, 43, 54, 55, 56, 57, 58, 62, 64, 65, 67, 68, 69, 70, 71.
*52. Little Huron River, T. 52 N., R. 29 W., sec. 17. Species: 2D, 10, 12, 16, 21, 26, 42, 43.
*53. Huron River, T. 52 N., R. 29 W., sec. 18. Species: 1, 2, 2D, 3, 10, 12, 16, 17, 18, 21, 22, 23, 25, 26, 28, 32, 33, 38, 39, 42, 43, 54, 55, 57, 58, 62, 64, 67, 68, 70.

Ontonagon County

*94. Misery River, T. 53 N., R. 37 W., sec. 10. Species: 1, 2, 2D, 3, 9, 10, 12, 16, 17, 18, 21, 25, 26, 27, 28, 29, 32, 36, 39, 42, 43, 47, 54, 55, 57, 62, 64, 65, 67, 68, 70, 71.
95. East Sleeping River, T. 53 N., R. 38 W., sec. 13. Species: 2D, 3, 21, 25, 26, 32, 42, 68, 70.
*96. Firesteel River, T. 52 N., R. 39 W., sec. 1. Species: 1, 2, 2D, 3, 9, 10, 12, 16, 17, 18, 21, 25, 26, 27, 28, 29, 32, 33, 36, 37, 39, 40, 42, 43, 44, 48, 54, 55, 56, 57, 58, 60, 61, 62, 64, 65, 67, 68, 70.
*97. Flintsteel River, T. 52 N., R. 39 W., sec. 1. Species: 1, 2, 2D, 3, 9, 10, 12, 16, 17, 18, 21, 23, 25, 26, 27, 28, 29, 32, 33, 39, 42, 43, 48, 54, 55, 56, 57, 60, 62, 64, 67, 68, 70.
98. Paddy's Creek, T. 52 N., R. 39 W., sec. 20. Species: 21, 25, 28, 32, 42, 68, 70.
99. Ontonagon River, T. 52 N., R. 40 W., sec. 25. Species: 1, 2D, 3, 9, 10, 12, 16, 17, 18, 20, 21, 23, 25, 26, 28, 29, 32, 33, 36, 38, 39, 40, 42, 43, 49, 55, 57, 58, 62, 63, 64, 65, 68, 69, 70.
100. First Creek, T. 52 N., R. 40 W., sec. 34. Species: 21, 25, 28, 32, 40, 42.
101. Second Creek, T. 52 N., R. 40 W., sec. 34. Species: 2D, 17, 21, 25, 28, 32, 38, 40, 42, 54, 68, 70.
102. Potato River, T. 52 N., R. 40 W., sec. 33. Species: 2D, 3, 21, 24, 25, 32, 36, 38, 40, 42, 54, 55, 62, 67, 68, 70.
103. Cranberry River, T. 51 N., R. 40 W., sec. 6. Species: 2D, 3, 10, 17, 21, 24, 25, 28, 32, 40, 42, 68, 70.

104. Little Cranberry River, T. 51 N., R. 40 W., sec. 6. Species: 21, 25, 42, 55, 68, 70.
105. Town Line River, T. 51 N., R. 41 W., sec. 1. Species: 42, 68, 70.
106. Duck Creek, T. 51 N., R. 41 W., sec. 11. Species: 54, 62, 68, 70.
107. Pine River, T. 51 N., R. 41 W., sec. 3. Species: 17, 38, 55, 68.
108. Stoney Creek, T. 51 N., R. 41 W., sec. 3. Species: 21, 25, 28, 32, 39, 40, 42, 55, 68.
109. Mineral River, T. 51 N., R. 41 W., sec. 7. Species: 21.
110. Iron River, T. 51 N., R. 42 W., sec. 12. Species: 2D, 17, 55, 68.
111. Little Iron River, T. 51 N., R. 42 W., sec. 11. Species: 2D, 3, 10, 23, 24, 32, 62, 68.
112. Union River, T. 51 N., R. 42 W., sec. 15. Species: 2D, 3, 10, 12, 16, 17, 21, 32, 40, 42, 43, 55, 56, 57, 67, 68, 70.
113. Carp River, T. 51 N., R. 44 W., sec. 33. Species: 10, 12.

WISCONSIN

Ashland County

*131. Bad River, T. 48 N., R. 2 W., sec. 17. Species: 1, 2, 2D, 3, 5, 9, 10, 12, 16, 17, 18, 19, 21, 24, 25, 26, 29, 32, 36, 37, 38, 40, 42, 43, 44, 45, 47, 48, 49, 51, 54, 55, 57, 58, 59, 60, 61, 62, 63, 64, 65, 67, 68, 69, 70.
132. Kakagen River, T. 48 N., R. 3 W., sec. 9. Species: 33, 38, 47, 68.
133. Bay City Creek, T. 48 N., R. 4 W., sec. 33. Species: 21, 25, 30, 42, 55.

Bayfield County

*134. Fish Creek, T. 47 N., R. 5 W., sec. 1. Species: 1, 2D, 3, 9, 10, 12, 16, 17, 21, 23, 24, 25, 26, 29, 32, 41, 42, 43, 47, 48, 54, 55, 57, 62, 64, 67, 68.
135. Whittlesey Creek, T. 48 N., R. 5 W., sec. 35. Species: 9, 10, 12.
136. Thompson Creek, T. 48 N., R. 4 W., sec. 6. Species: 12.
137. Sioux River, T. 49 N., R. 4 W., sec. 9. Species: 2D, 9, 10, 12, 16.
138. Onion River, T. 49 N., R. 4 W., sec. 5. Species: 9, 10, 12.
139. Pikes Creek, T. 50 N., R. 4 W., sec. 27. Species: 10, 12.
140. Brickyard Creek, T. 50 N., R. 3 W., sec. 6. Species: 10.
141. Chicago Creek, T. 51 N., R. 3 W., sec. 31. Species: 12.
142. Raspberry River, T. 52 N., R. 4 W., sec. 35. Species: 2D, 3, 21, 28, 32, 42, 55, 68, 70.
143. Sand River, T. 52 N., R. 5W., sec. 36. Species: 2D, 3, 10, 12, 26, 32, 42, 55, 62, 67, 68, 70.
144. Siskiwit River, T. 51 N., R. 6 W., sec. 34. Species: 3, 9, 10, 21, 33, 42, 68, 70, 71.
145. Lost Creek, T. 51 N., R. 6 W., sec. 32. Species: 12, 42, 55, 70.
146. Bark River, T. 50 N., R. 6 W., sec. 6. Species: 9, 70.
*147. Cranberry River, T. 50 N., R. 7 W., sec. 5. Species: 1, 2D, 3, 9, 10, 12, 16, 17, 18, 21, 23, 25, 26, 29, 33, 40, 42, 43, 50, 54, 55, 57, 67, 68, 70, 71.
148. Flag River, T. 50 N., R. 8 W., sec. 20. Species: 9, 10, 12, 23, 68, 70.
*149. Iron River, T. 50 N., R. 9 W., sec. 34. Species: 1, 2D, 9, 10, 16, 23, 26, 29, 32, 33, 42, 43, 45, 50, 57, 59, 60, 63, 64, 67, 68, 70.
*150. Reefer Creek, T. 49 N., R. 9 W., sec. 4. Species: 1, 2D, 3, 9, 12, 16, 17, 20, 21, 23, 24, 25, 26, 29, 30, 32, 33, 36, 40, 42, 43, 47, 50, 55, 57, 62, 63, 64, 67, 68, 70.
*151. Fish Creek, T. 49 N., R. 9 W., sec. 5. Species: 1, 2D, 3, 9, 12, 16, 17, 18, 21, 23, 24, 25, 26, 32, 33, 36, 38, 40, 42, 43, 47, 50, 57, 62, 67, 68, 70, 71.

Douglas County

*152. Brule River, T. 49 N., R. 10 W., sec. 10. Species: 1, 2, 2D, 3, 6, 9, 10, 12, 14, 15, 16, 17, 18, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 32, 33, 38, 39, 40, 41, 42, 43, 44, 45, 47, 48, 49, 50, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 67, 68, 69, 70, 71.
*153. Poplar River, T. 49 N., R. 11 W., sec. 30. Species: 1, 2, 2D, 3, 9, 10, 12, 16, 17, 18, 21, 22, 23, 24, 25, 26, 29, 32, 33, 36, 38, 40, 42, 43, 47, 50, 51, 54, 55, 56, 57, 62, 64, 65, 67, 68, 70.
*154. Middle River, T. 49 N., R. 12 W., sec. 35. Species: 1, 2, 2D, 3, 7, 9, 10, 12, 15, 16, 17, 18, 21, 23, 24, 25, 26, 29, 32, 33, 36, 38, 39, 40, 41, 42, 43, 45, 47, 50, 54, 55, 56, 57, 58, 61, 62, 63, 64, 65, 67, 68, 70, 71.
*155. Amnicon River, T. 49 N., R. 12 W., sec. 27. Species: 1, 2, 2D, 3, 9, 10, 12, 15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 32, 33, 36, 37, 38, 39, 40, 42, 43, 44, 45, 47, 50, 51, 54, 55, 57, 60, 61, 62, 63, 64, 65, 67, 68, 70.
*156. Nemadji River, T. 49 N., R. 13 W., sec. 29. Species: 1, 2, 2D, 3, 9, 10, 12, 16, 17, 18, 19, 21, 23, 24, 25, 26, 29, 32, 33, 36, 38, 42, 43, 44, 45, 47, 49, 50, 51, 54, 55, 57, 61, 62, 64, 65, 67, 68, 70.
157. St. Louis River. See St. Louis County, Minnesota.

Iron County

120. Montreal River. See Gogebic County, Michigan.
128. Oronto Creek, T. 47 N., R. 1 W., sec. 12. Species: 10, 16, 26, 32, 36, 41, 42, 68, 70.

129. Graveyard Creek, T. 47 N., R. 1 W., sec. 3. Species: 10, 12, 26, 57, 70.
130. Bell Creek, T. 47 N., R. 1 W., sec. 6. Species: 10, 12, 21, 26, 42.

MINNESOTA

Cook County

169. Cross River, T. 58 N., R. 5 W., sec. 1. Species: 3, 11.
170. Poplar River, T. 60 N., R. 3 W., sec. 33. Species: 3.
171. Cascade River, T. 60 N., R. 2 W., sec. 1. Species: 9, 10, 12, 25, 58, 71.
172. Devils Track River, T. 61 N., R. 1 E., sec. 13. Species: 10, 21, 54, 71.
173. Kadunce River, T. 61 N., R. 2 E., sec. 2. Species: 10, 12, 25, 28, 40.
174. Arrowhead River, T. 62 N., R. 3 E., sec. 34. Species: 3, 10, 18, 42, 65.
175. Pigeon River, T. 64 N., R. 7 E., sec. 29. Species: 3.

Lake County

162. Knife River, T. 52 N., R. 11 W., sec. 31. Species: 3, 10, 21, 25, 26, 32, 42, 55.
163. Stewart River, T. 53 N., R. 10 W., sec. 29. Species: 3, 10, 32, 42.
164. Encampment Creek, T. 53 N., R. 10 W., sec. 11. Species: 22, 25.
165. Gooseberry River, T. 54 N., R. 9 W., sec. 22. Species: 21, 25, 42.
166. Splitrock River, T. 54 N., R. 8 W., sec. 7. Species: 3, 21, 25, 26, 40, 42, 55, 57, 70.
167. Baptism River, T. 56 N., R. 7 W., sec. 15. Species: 3.
168. Caribou River, T. 58 N., R. 6 W., sec. 36. Species: 12, 28, 71.

St. Louis County

157. St. Louis River, T. 49 N., R. 14 W., sec. 10. Species: 9, 17, 20, 21, 23, 24, 25, 32, 33, 42, 43, 46, 54, 55, 65, 67, 69.
158. Lester River, T. 50 N., R. 13 W., sec. 8. Species: 23.
159. Talmadge River, T. 51 N., R. 12 W., sec. 19. Species: 10, 25, 40, 55.
160. French River, T. 51 N., R. 12 W., sec. 17. Species: 10, 25.
161. Sucker River, T. 51 N., R. 12 W., sec. 10. Species: 3.

SPECIES RECORDS BY STREAM

Seventy-one species of fish representing 20 families were collected from 175 streams tributary to Lake Superior. Sixty-four of these species have been reported from Lake Superior by Hubbs and Lagler (1958). Those not reported by Hubbs and Lagler (1958) are the longnose gar, Lepisosteus osseus; bowfin, Amia calva; pink salmon, Oncorhynchus gorbuscha; rosyface shiner, Notropis rubellus; stonecat, Noturus flavus; tadpole madtom, Noturus gyrinus; and blackside darter, Percina maculata.

The large number of fishes collected provided mature adults of each species for identification. Representative samples of each species are preserved in the fish collection of the Bureau of Commercial Fisheries Biological Station, Marquette, Mich. No attempt was made to identify hybrids. Immature fathead minnows from the Sturgeon River, Houghton County, Mich., were identified by Reeve M. Bailey of the Museum of Zoology, The University of Michigan, Ann Arbor, Mich.

Distribution maps indicate the presence of species by stream (figs. 2-52). Fishes were taken from more than 3,000 collection stations on U.S. streams tributary to Lake Superior. The exact location of each station is on file at the Bureau of Commercial Fisheries Biological Station, Marquette, Mich.

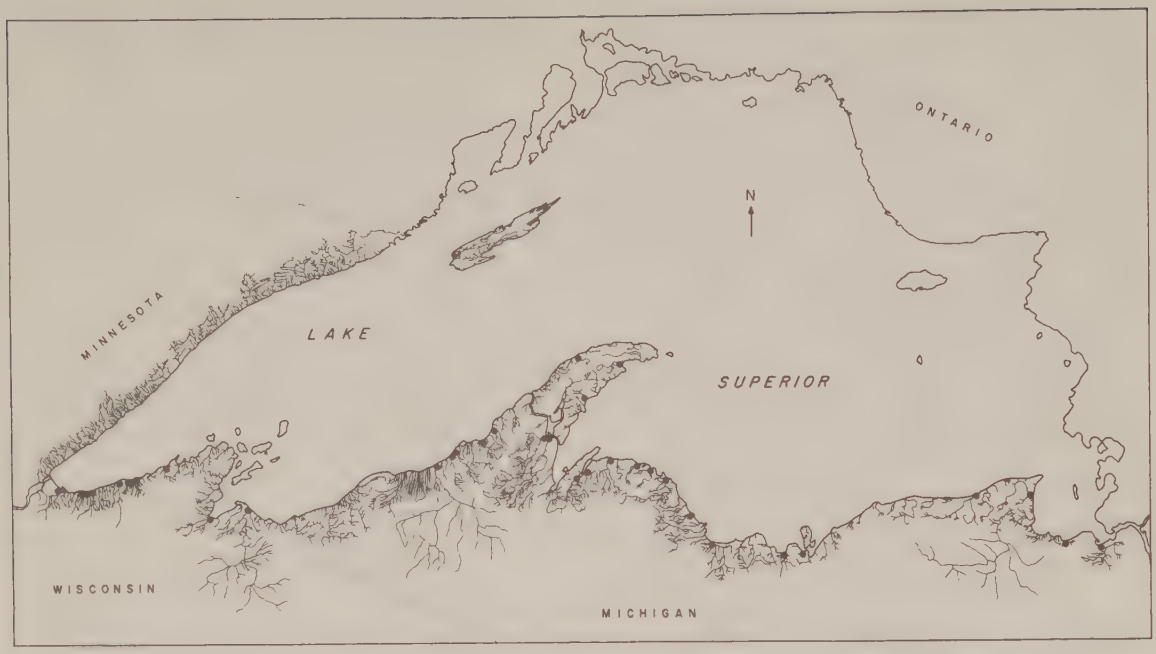

Figure 2.--Silver lamprey (adult), Ichthyomyzon unicuspis.

1. Ichthyomyzon unicuspis Hubbs and Trautman, silver lamprey (adult) (fig. 2)

Adult silver lampreys were collected from 35 streams. Ammocetes of the genus Ichthyomyzon have been found in all of these streams except the Two Hearted River, Luce County, and Furnace Creek, Alger County, Mich.

Records by state and county:

Michigan - Chippewa 1, 3, 14; Luce 19; Alger 33, 35; Marquette 40, 46, 49, 50, 51, 53; Baraga 55, 57; Houghton 64, 65, 70, 92; Keweenaw 72, 81; Ontonagon 94, 96, 97, 99.

Wisconsin - Ashland 131; Bayfield 134, 147, 149, 150, 151; Douglas 152, 153, 154, 155, 156.

Figure 3.--Northern brook lamprey (adult), Ichthyomyzon fossor.

2. Ichthyomyzon fossor Reighard and Cummins, northern brook lamprey (adult) (fig. 3)

The distribution of northern brook lampreys is widespread along the south shore of Lake Superior with the exception of Luce and Alger Counties, Mich., where the American brook lamprey, Lampetra lamottei, reaches its peak abundance. Inability to differentiate between larvae of Ichthyomyzon unicuspis and Ichthyomyzon fossor impairs definition of the distribution of these species. Adult northern brook lampreys have been collected from 24 streams, and Ichthyomyzon larvae have been collected from 59. The traps at the electric barriers do not retain adult northern brook lampreys.

Records by state and county:

Michigan - Chippewa 12, 14; Marquette 40, 46, 49, 50, 51, 53; Baraga 55, 57; Houghton 64, 65, 70; Keweenaw 71, 72; Ontonagon 94, 96, 97.

Wisconsin - Ashland 131; Douglas 152, 153, 154, 155, 156.

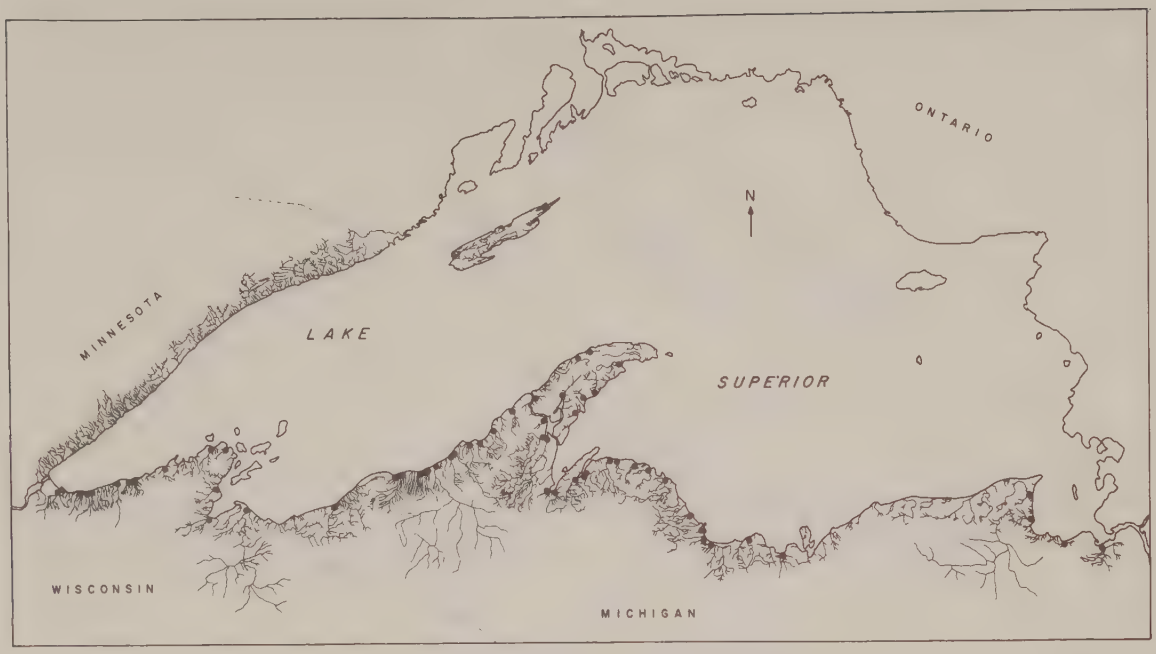

Figure 4.--Silver and northern brook lampreys (ammocetes), Ichthyomyzon sp.

2D. Ichthyomyzon sp., silver and northern brook lamprey ammocetes, (fig. 4)

Records of collections of larvae of the genus Ichthyomyzon from 59 Lake Superior tributaries are included as supplemental to those for adult Ichthyomyzon unicuspis and Ichthyomyzon fossor.

Records by state and county:

Michigan - Chippewa 1, 3, 12, 14; Alger 35, 38; Marquette 40, 41, 44, 46, 49, 50, 51, 52, 53; Baraga 55, 56, 57, 60, 61; Houghton 64, 65, 66, 67, 69, 70, 85, 90, 92; Keweenaw 71, 72, 77, 81; Ontonagon 94, 95, 96, 97, 99, 101, 102, 103, 110, 111, 112; Gogebic 117.

Wisconsin - Ashland 131; Bayfield 134, 137, 142, 143, 147, 149, 150, 151; Douglas 152, 153, 154, 155, 156.

Figure 5.--Sea lamprey, Petromyzon marinus.

3. Petromyzon marinus Linnaeus, sea lamprey (fig. 5)

Sea lampreys have been collected from 90 U.S. streams tributary to Lake Superior. Larval sea lampreys have been collected from 78 of these streams.

Sea lampreys are continuing to infest Lake Superior streams. Surveys during 1963 revealed seven additional streams with sea lamprey ammocetes.

Records by state and county:

Michigan - Chippewa 1, 3, 4, 5, 7, 8, 11, 12, 14; Luce 17, 18, 19, 20; Alger 21, 22, 23, 24, 25, 26, 27, 28, 29, 31, 33, 34, 35, 36, 37, 38, 39; Marquette 40, 41, 44, 46, 47, 48, 49, 50, 51, 53; Baraga 55, 56, 57, 60, 61; Houghton 64, 66, 68, 69, 70, 84, 85, 90, 91, 92; Keweenaw 72, 77, 81, 121; Ontonagon 94, 95, 96, 97, 99, 102, 103, 111, 112.

Wisconsin - Ashland 131; Bayfield 134, 142, 143, 144, 147, 150, 151; Douglas 152, 153, 154, 155, 156.

Minnesota - St. Louis 161; Lake 162, 163, 166, 167; Cook 169, 170, 174, 175.

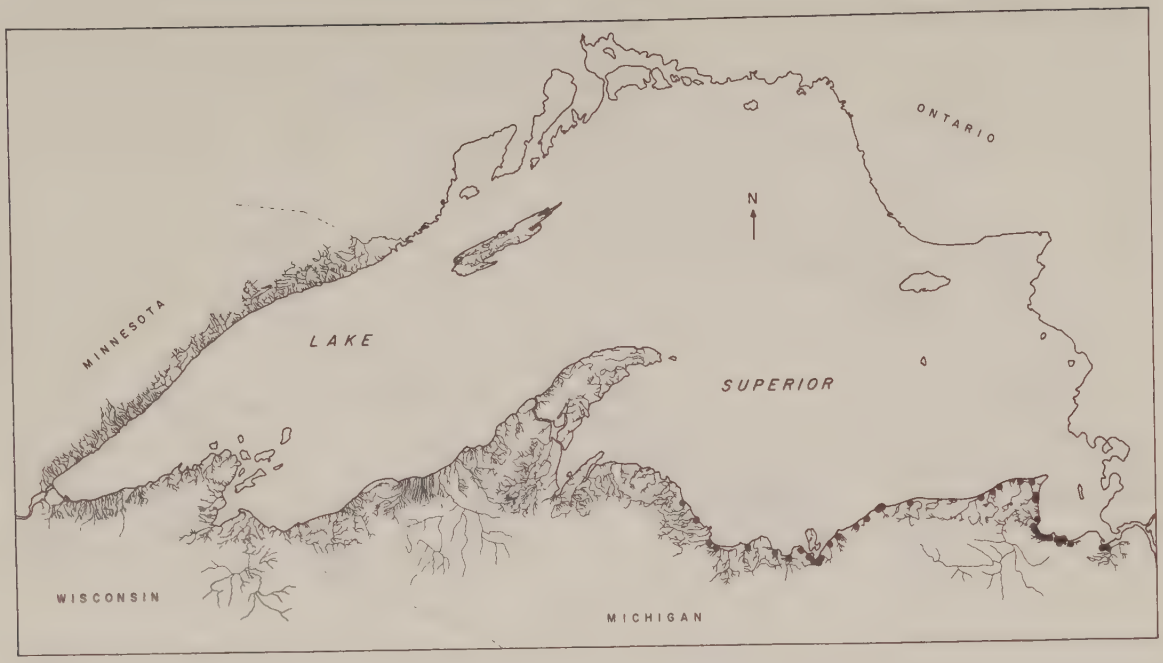

Figure 6.--American brook lamprey, Lampetra lamottei.

4. Lampetra lamottei (Lesueur), American brook lamprey (fig. 6)

The American brook lamprey was found in 38 streams of eastern Lake Superior. Its range is the most restricted of the native lampreys.

Records by state and county:

Michigan - Chippewa 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16; Luce 17, 18, 19; Alger 21, 23, 24, 25, 26, 27, 28, 29, 30, 31, 33, 34, 35, 36, 38; Marquette 40, 41, 46, 48.

Figure 7.--Lake sturgeon, Acipenser fulvescens. longnose gar, Lepisosteus osseus; bowfin, Amia calva; alewife, Alosa pseudoharengus.

5. Acipenser fulvescens Rafinesque, lake sturgeon (fig. 7)

Lake sturgeon were recorded from two of the larger river systems; the Sturgeon River, Houghton County, Mich., and the Bad River, Ashland County, Wis. Some specimens exceeded the length of a 6-foot barrier trap.

Records by state and county:

Michigan - Houghton 64.
Wisconsin - Ashland 131.

6. Lepisosteus osseus (Linnaeus), longnose gar (fig. 7)

A male longnose gar, 676 mm. long, was caught in September 1963 by a sports fisherman below the electric barrier on the Brule River, Douglas County, Wis.

Record by state and county:

Wisconsin - Douglas 152.

7. Amia calva Linnaeus, bowfin (fig. 7)

A female bowfin, 357 mm. total length, was captured June 1, 1960, at the Middle River barrier, Douglas County, Wis.

Record by state and county:

Wisconsin - Douglas 154.

8. Alosa pseudoharengus (Wilson), alewife (fig. 7)

The alewife has recently invaded Lake Superior, but was encountered rarely in tributary streams.

Records by state and county:

Michigan - Chippewa 1; Alger 21; Baraga 57, 60; Houghton 70.

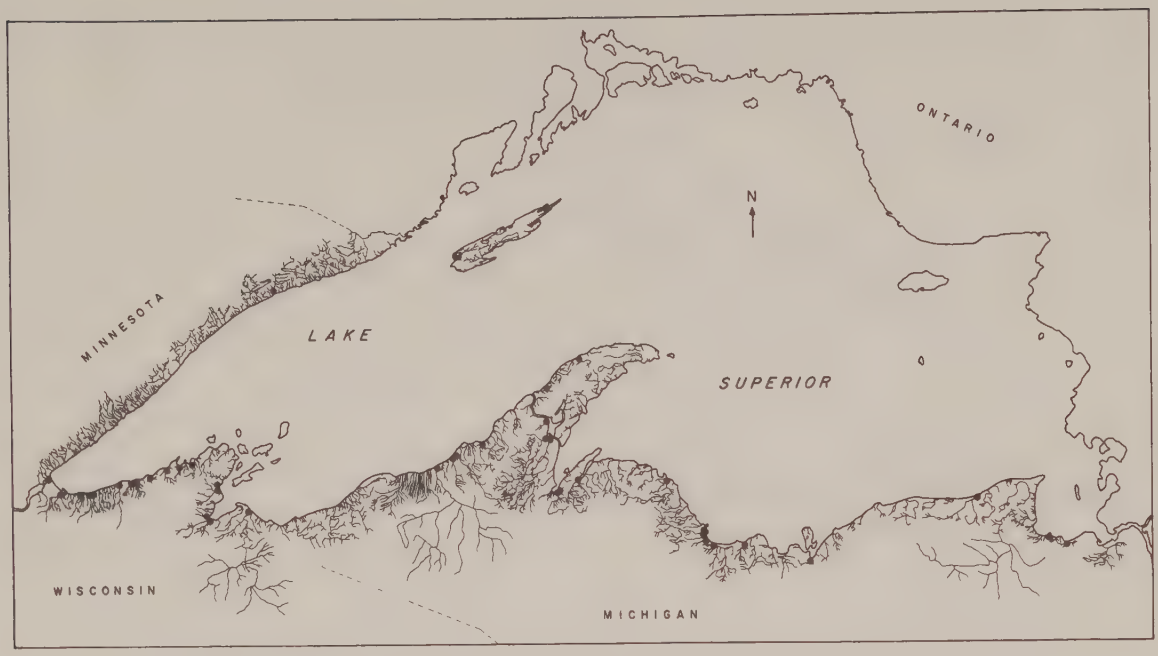

Figure 8.--Brown trout, Salmo trutta.

9. Salmo trutta Linnaeus, brown trout (fig. 8)

The brown trout, an exotic fish, is now common to streams of Lake Superior. It has been widely introduced and is well established. Lake-run populations reach their greatest abundance in western Lake Superior.

Records by state and county:

Michigan - Chippewa 3, 6; Luce 19; Alger 31, 39; Marquette 40, 41, 43, 44, 49; Baraga 57, 59, 60; Houghton 64, 65, 66, 83; Keweenaw 81; Ontonagon 94, 96, 97, 99.

Wisconsin - Ashland 131; Bayfield 134, 135, 137, 138, 144, 146, 147, 148, 149, 150, 151; Douglas 152, 153, 154, 155, 156.

Minnesota - St. Louis 157; Cook 171.

Figure 9.--Rainbow trout, Salmo gairdneri.

10. Salmo gairdneri Richardson, rainbow trout (fig. 9)

The rainbow trout, an exotic species, is well established in Lake Superior. Traps at the sea lamprey barriers capture adult rainbow trout each spring, and large numbers have been observed upstream before the barriers were activated.

Records by state and county:

Michigan - Chippewa 1, 3, 4, 5, 6, 7, 8, 9, 12, 14; Luce 17, 18, 19, 20; Alger 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 33, 34, 35, 36, 37, 38, 39; Marquette 40, 41, 42, 43, 44, 46, 47, 48, 49, 50, 51, 52, 53; Baraga 54, 55, 56, 57, 58, 59, 60, 62, 63; Houghton 64, 65, 66, 67, 69, 70, 83, 84, 85, 87, 88, 89, 91, 92, 93; Keweenaw 71, 72, 73, 76, 77, 79, 81, 121, 127; Ontonagon 94, 96, 97, 99, 103, 111, 112, 113; Gogebic 118, 119.

Wisconsin - Iron 128, 129, 130; Ashland 131; Bayfield 134, 135, 137, 138, 139, 140, 143, 144, 147, 148, 149; Douglas 152, 153, 154, 155, 156.

Minnesota - St. Louis 159, 160; Lake 162, 163; Cook 171, 172, 173, 174.

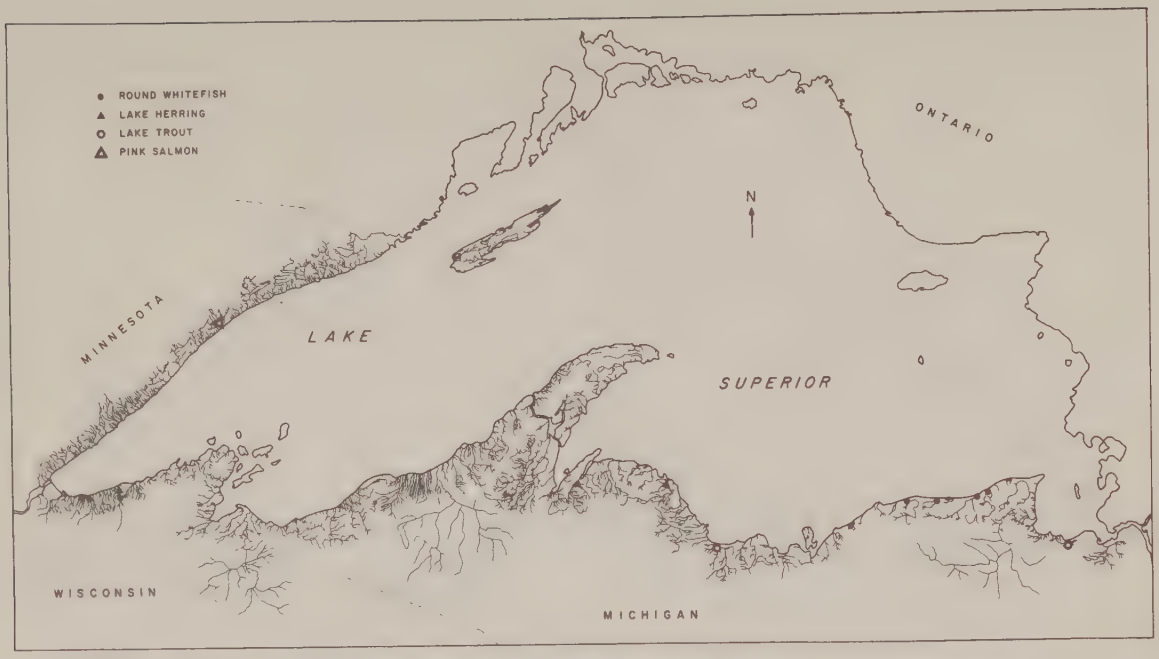

Figure 10.--Pink salmon, Oncorhynchus gorbuscha; lake trout, Salvelinus namaycush; lake herring, Coregonus artedii; round whitefish, Prosopium cylindraceum.

11. Oncorhynchus gorbuscha (Walbaum), pink salmon (fig. 10)

Six adult pink salmon, an exotic species, were observed in the Cross River, Cook County, Minn., on September 20, 1963, by Willard O. Brewington, a stream survey leader of the Bureau's Biological Station at Marquette.

Record by state and county:

Minnesota - Cook 169.

13. Salvelinus namaycush (Walbaum), lake trout (fig. 10)

Small numbers of lake trout were captured at the electric barrier on Pendills Creek. They were immature fish, and undoubtedly came from the Pendills Creek Fish Cultural Station. One immature lake trout was captured upstream from the mouth of the Chocolay River, which also has a lake-trout hatchery.

Records by state and county:

Michigan - Chippewa 3; Marquette 40.

14. Coregonus artedii Lesueur, lake herring (fig. 10)

Small numbers of lake herring were captured in three of the larger rivers of Lake Superior.

Records by state and county:

Michigan - Marquette 49; Baraga 57.

Wisconsin - Douglas 152.

15. Prosopium cylindraceum (Pallas), round whitefish (fig. 10)

The round whitefish is common along the south shore of Lake Superior, but is not common in streams.

Records by state and county:

Michigan - Luce 18, 19, 20; Alger 21, 26.

Wisconsin - Douglas 152, 154, 155.

Figure 11.--Brook trout, Salvelinus fontinalis.

12. Salvelinus fontinalis (Mitchill), brook trout (fig. 11)

Brook trout are common in the tributary streams of Lake Superior, and many are captured each spring in the traps at the electric barriers.

Records by state and county:

Michigan - Chippewa 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14; Luce 17, 18, 19, 20; Alger 21, 23, 24, 25, 26, 27, 28, 29, 30, 31, 33, 34, 35, 36, 38, 39; Marquette 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53; Baraga 55, 56, 57, 61, 63; Houghton 64, 65, 66, 67, 69, 70, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93; Keweenaw 71, 72, 74, 75, 76, 77, 78, 79, 81, 121, 122, 123, 124, 127; Ontonagon 94, 96, 97, 99, 112, 113; Gogebic 115, 116, 118, 119.

Wisconsin - Iron 129, 130; Ashland 131; Bayfield 134, 135, 136, 137, 138, 139, 141, 143, 145, 147, 148, 150, 151; Douglas 152, 153, 154, 155, 156.

Minnesota - Lake 168; Cook 171, 173.

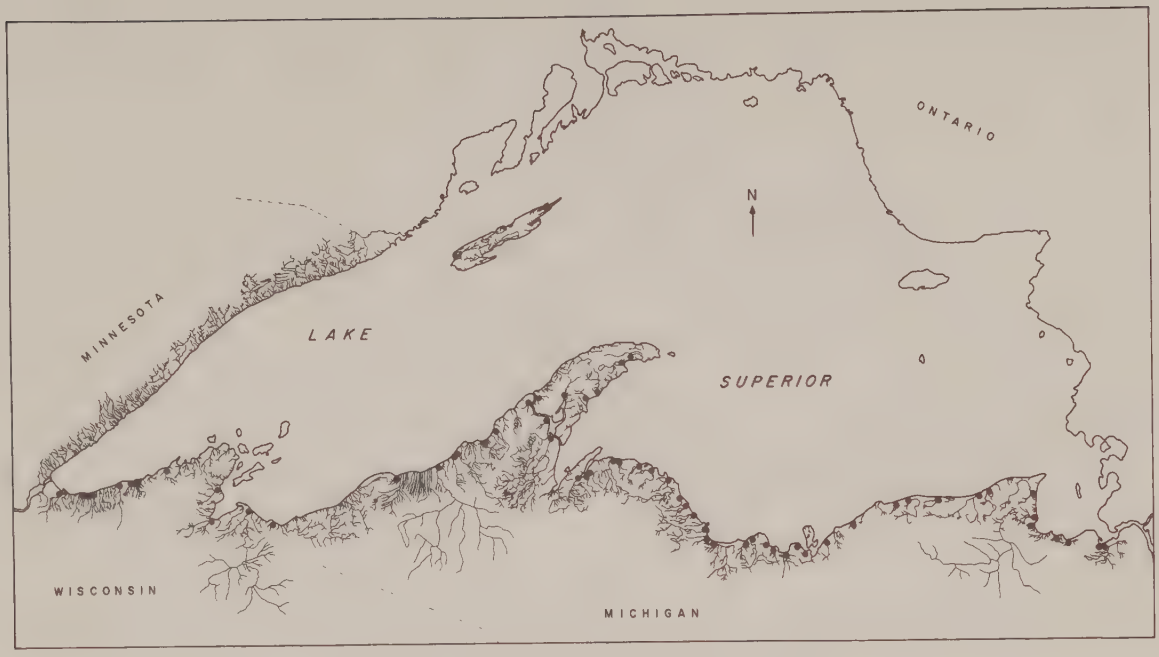

Figure 12.--American smelt, Osmerus mordax.

16. Osmerus mordax (Mitchill), American smelt (fig. 12)

The American smelt, an exotic species, a recent immigrant from Lake Huron is now distributed throughout Lake Superior. Its distribution undoubtedly is greater than our collections indicate.

Records by state and county:

Michigan - Chippewa 1, 2, 3, 5, 11, 12, 14; Luce 18, 19, 20; Alger 21, 22, 26, 28, 33, 34, 35, 36, 37, 38, 39; Marquette 40, 41, 44, 46, 47, 48, 49, 50, 51, 52, 53; Baraga 55, 56, 57; Houghton 64, 66, 67, 70, 85, 89, 92; Keweenaw 71, 72, 73; Ontonagon 94, 96, 97, 99, 112.

Wisconsin - Iron 128; Ashland 131; Bayfield 134, 137, 147, 149, 150, 151; Douglas 152, 153, 154, 155, 156.

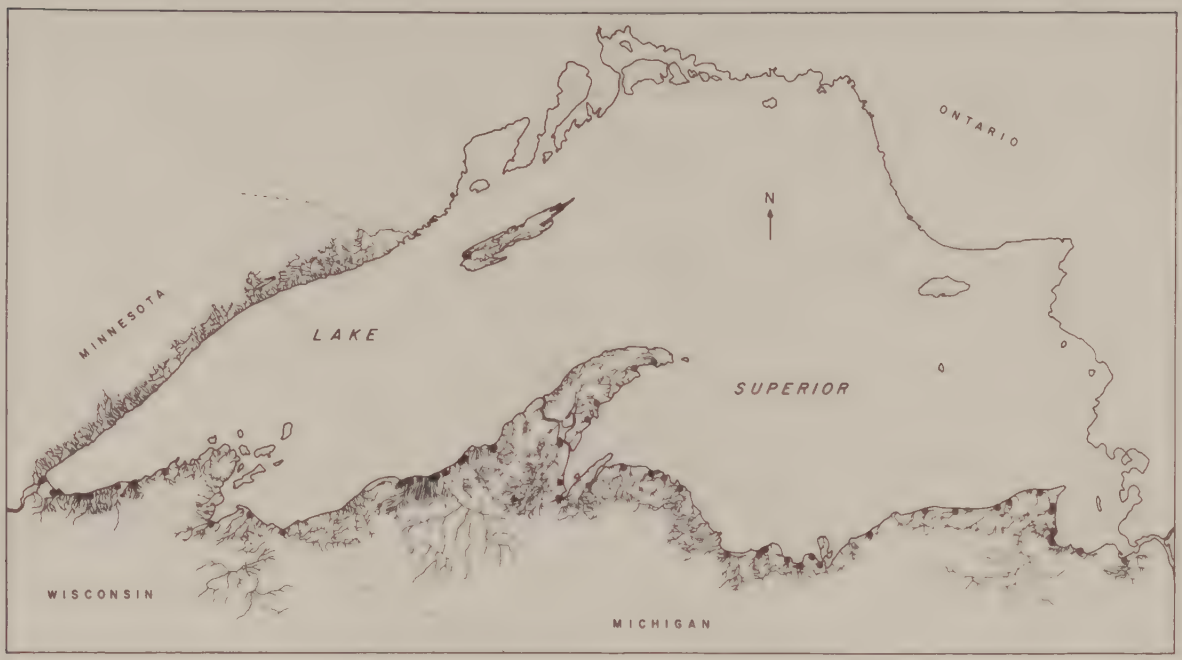

Figure 13.--Central mudminnow, Umbra limi.

17. Umbra limi (Kirtland), central mudminnow (fig. 13)
Central mudminnows are widely distributed in streams of Lake Superior.

Records by state and county:

Michigan - Chippewa 1, 4, 10, 11, 12, 13, 14, 16; Luce 18, 19, 20; Alger 21, 26, 33, 34, 35, 36, 38, 39; Marquette 40, 49, 50, 51, 53; Baraga 57, 61, 62; Houghton 64, 69, 70; Keweenaw 72, 74; Ontonagon 94, 96, 97, 99, 101, 103, 107, 110, 112; Gogebic 120.

Wisconsin - Ashland 131; Bayfield 134, 147, 150, 151; Douglas 152, 153, 154, 155, 156.

Minnesota - St. Louis 157.

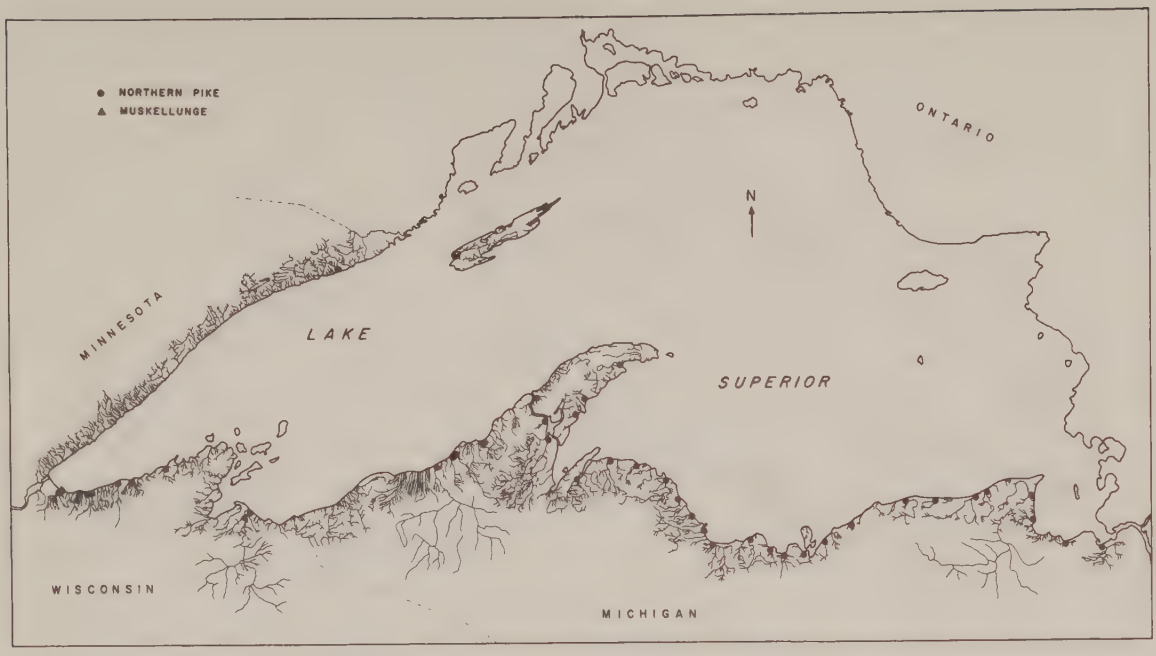

Figure 14.--Northern pike, Esox lucius; muskellunge, Esox masquinongy.

18. Esox lucius Linnaeus, northern pike (fig. 14)
Northern pike are common to streams of Lake Superior.

Records by state and county:

Michigan - Chippewa 1, 3, 12, 14; Luce 18, 19, 20; Alger 21, 26, 28, 33, 35, 36, 38; Marquette 40, 44, 46, 48, 49, 51, 53; Baraga 57; Houghton 64, 66, 69, 70, 85; Keweenaw 72; Ontonagon 94, 96, 97, 99.

Wisconsin - Ashland 131; Bayfield 147, 151; Douglas 152, 153, 154, 155, 156.

Minnesota - Cook 174.

19. Esox masquinongy Mitchill, muskellunge (fig. 14)
Muskellunge are rare in the collections. The collected specimens were large individuals from Wisconsin streams.

Records by state and county:

Wisconsin - Ashland 131; Douglas 155, 156.

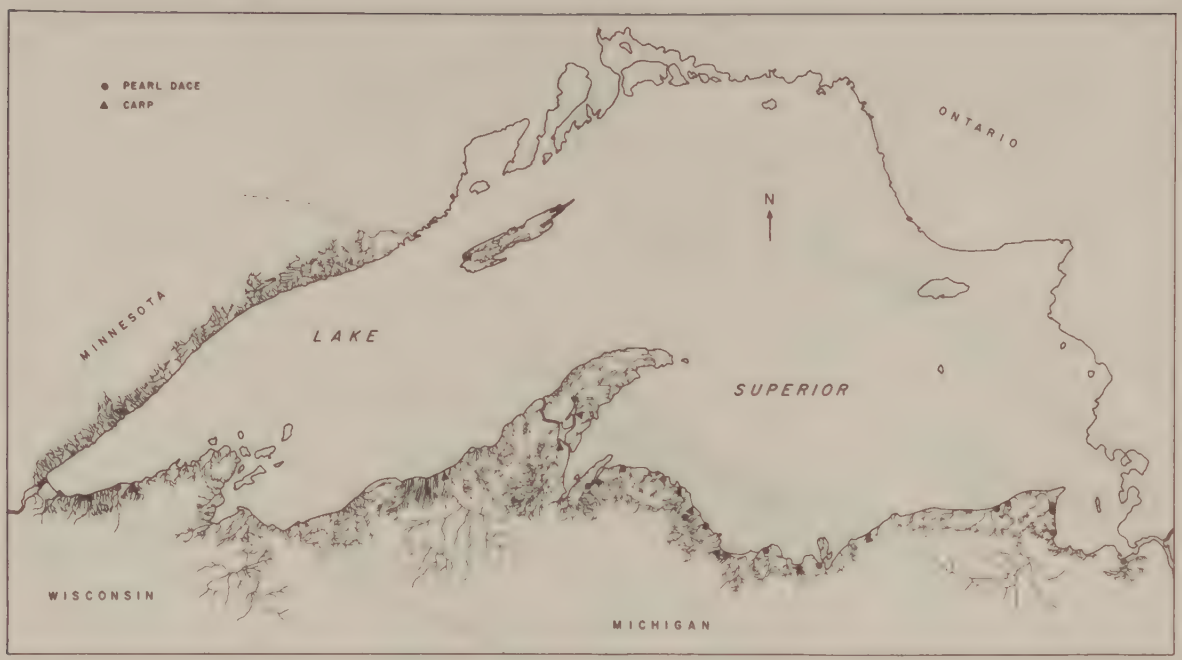

Figure 15.--Carp, Cyprinus carpio; pearl dace, Semotilus margarita.

20. Cyprinus carpio Linnaeus, carp (fig. 15)

The carp, an exotic species, occurred rarely in the collections.

Records by state and county:

Michigan - Alger 26, 35; Marquette 41, 48, 49; Houghton 64, 67, 68; Ontonagon 99.
Wisconsin - Bayfield 150.
Minnesota - St. Louis 157.

22. Semotilus margarita (Cope), pearl dace (fig. 15)

The pearl dace was encountered rarely in streams tributary to Lake Superior. Records from a Lake Michigan tributary indicate large numbers may be captured and retained in barrier traps, but no trap in Lake Superior took large numbers of this species.

Records by state and county:

Michigan - Chippewa 1, 12, 13, 14; Luce 18, 19; Alger 33, 38; Marquette 40, 46, 48, 50, 53; Baraga 55, 57.
Wisconsin - Douglas 152, 153, 155.
Minnesota - Lake 164.

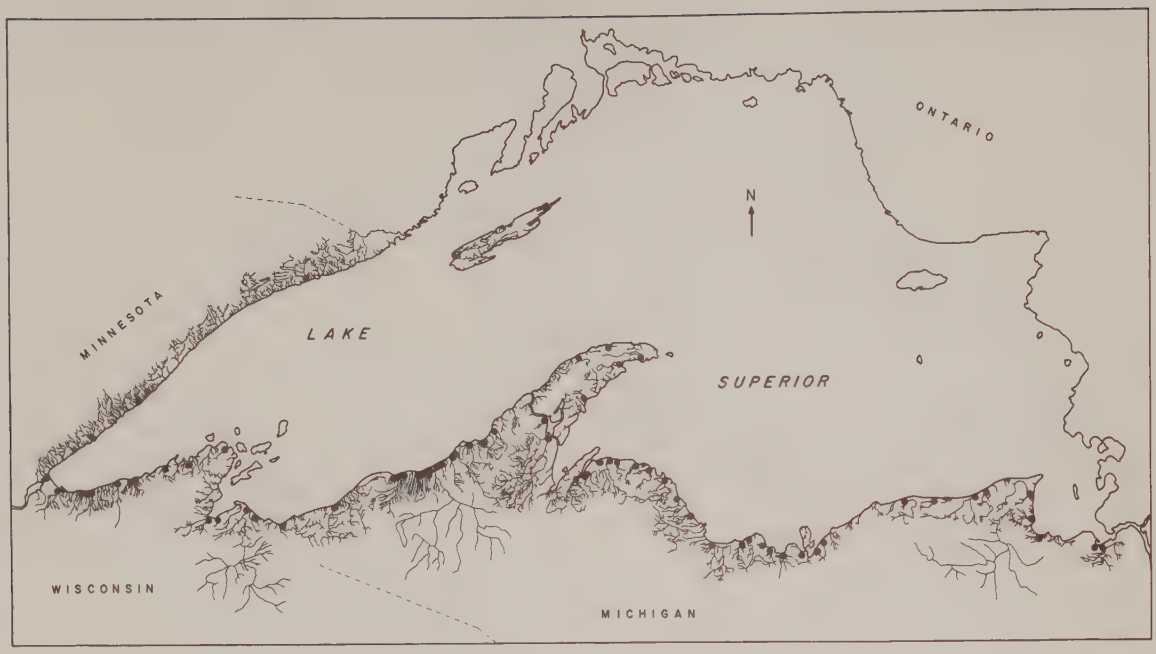

Figure 16.--Creek chub, Semotilus atromaculatus.

21. Semotilus atromaculatus (Mitchill), creek chub (fig. 16)

The creek chub is common in streams entering Lake Superior. Large numbers were captured at the barriers.

Records by state and county:

Michigan - Chippewa 1, 2, 8, 12, 14; Luce 18, 19, 20; Alger 21, 28, 29, 33, 35, 36, 37, 38, 39; Marquette 40, 46, 48, 49, 50, 51, 52, 53; Baraga 54, 55, 56, 57; Houghton 64, 66, 70, 92; Keweenaw 72, 74, 77, 81; Ontonagon 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 108, 109, 112; Gogebic 117, 120.

Wisconsin - Iron 130; Ashland 131, 133; Bayfield 134, 142, 144, 147, 150, 151; Douglas 152, 153, 154, 155, 156.

Minnesota - St. Louis 157; Lake 162, 165, 166; Cook 172.

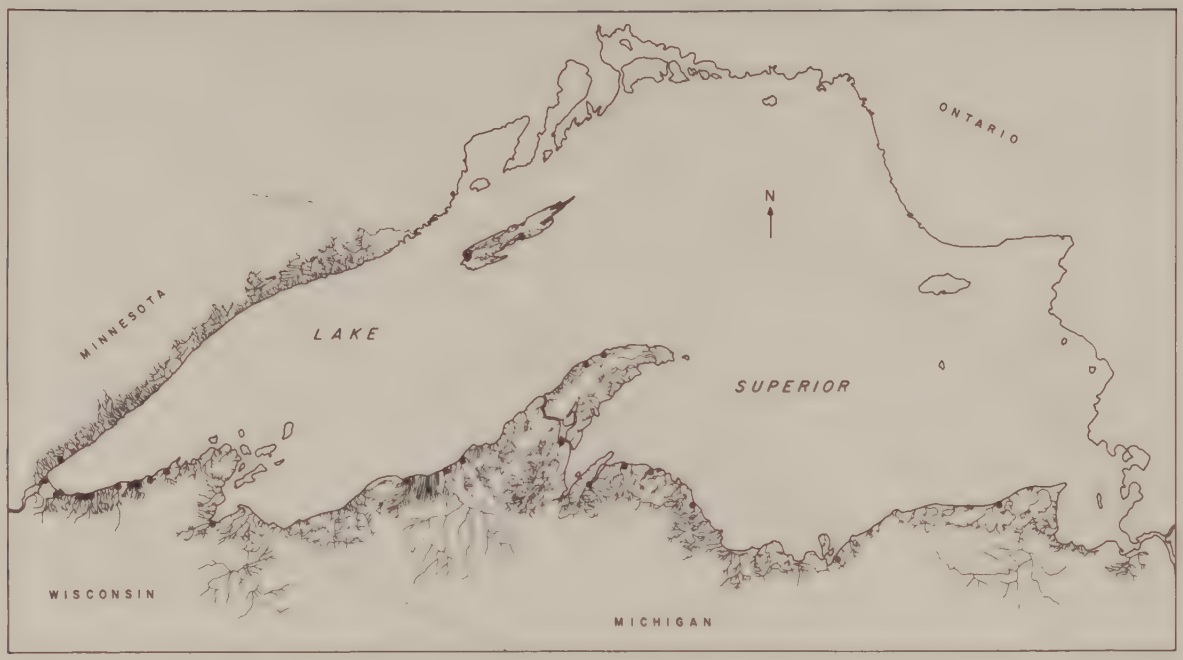

Figure 17.--Lake chub, Hybopsis plumbea.

23. Hybopsis plumbea (Agassiz), lake chub (fig. 17)

Thousands of lake chubs were captured in barrier traps on strems in Bayfield and Douglas Counties, Wis. Few specimens were collected in the remaining streams of Lake Superior.

Records by state and county:

Michigan - Luce 19; Alger 29; Marquette 48, 51, 53; Baraga 57; Houghton 64; Keweenaw 80, 82, 126, 127; Ontonagon 97, 99, 111.

Wisconsin - Bayfield 134, 147, 148, 149, 150, 151; Douglas 152, 153, 154, 155, 156.

Minnesota - St. Louis 157, 158.

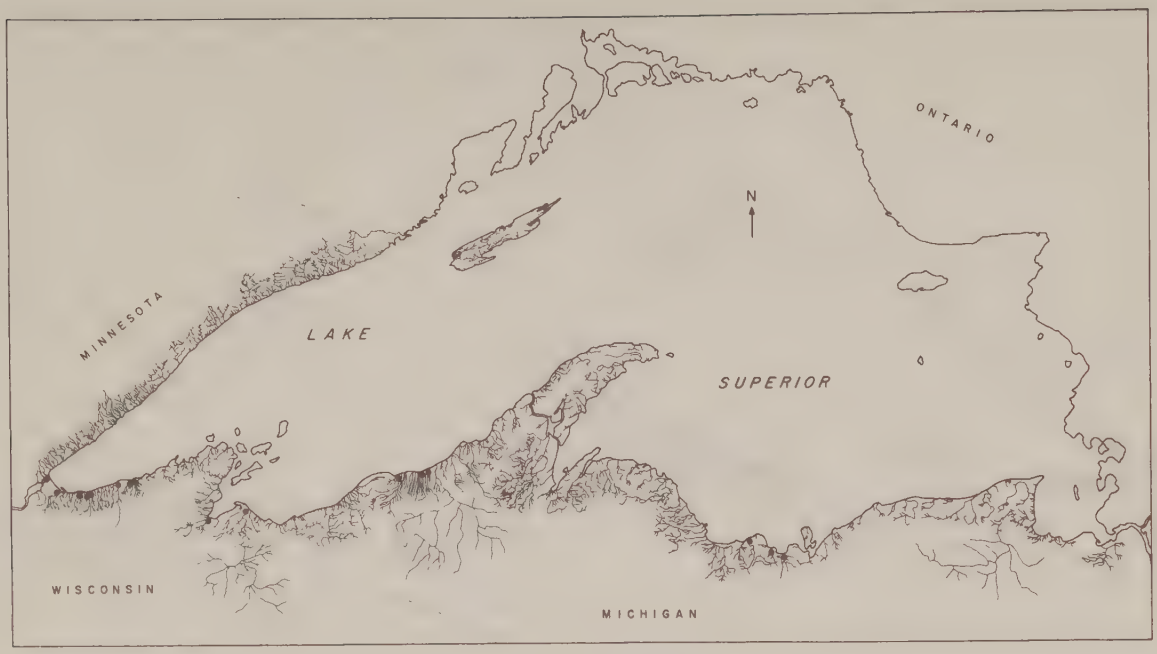

Figure 18.--Hornyhead chub, Hybopsis biguttata.

24. Hybopsis biguttata (Kirtland), hornyhead chub (fig. 18)

The hornyhead chub is common in streams tributary to western Lake Superior, but was collected rarely in eastern tributary streams.

Records by state and county:

Michigan - Alger 35, 36, 38; Ontonagon 102, 103, 111.
Wisconsin - Ashland 131; Bayfield 134, 150, 151; Douglas 152, 153, 154, 155, 156.
Minnesota - St. Louis 157.

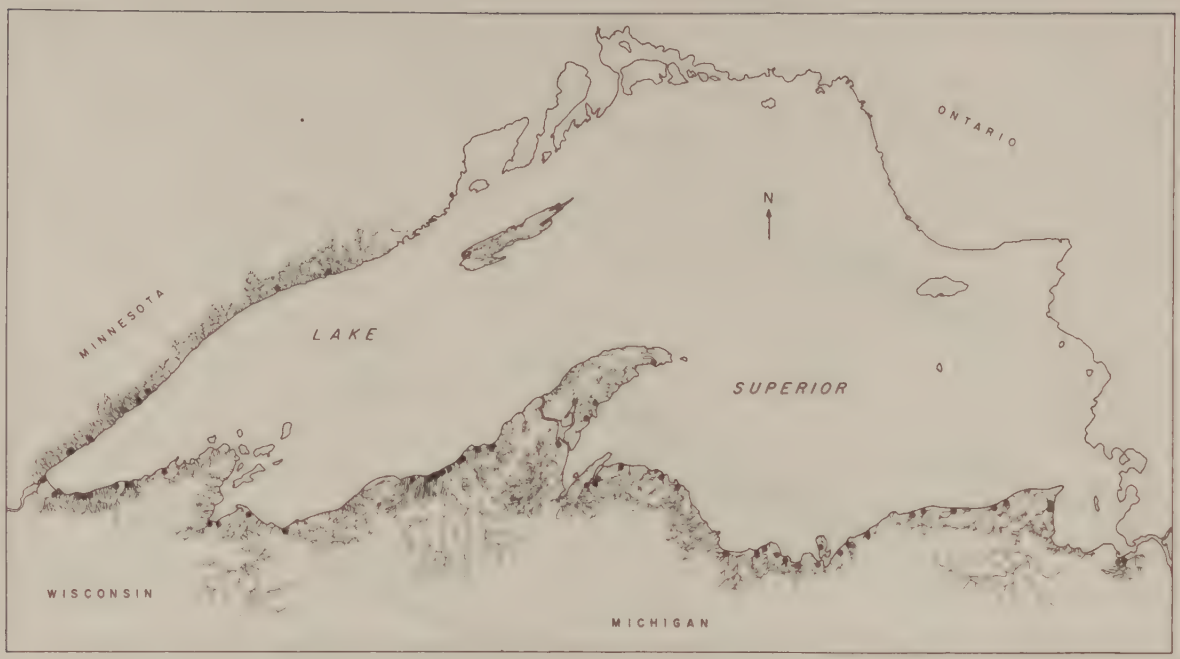

Figure 19.--Blacknose dace, Rhinichthys atratulus.

25. Rhinichthys atratulus (Hermann), blacknose dace (fig. 19)
The blacknose dace is widespread in Lake Superior streams.

Records by state and county:

Michigan - Chippewa 1, 2, 13, 14; Luce 18, 19, 20; Alger 21, 22, 26, 27, 28, 32, 33, 35, 36, 37, 38, 39; Marquette 40, 49, 50, 53; Baraga 55, 56, 57; Houghton 64, 67, 69, 70; Keweenaw 74; Ontonagon 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 108; Gogebic 120.

Wisconsin - Ashland 131, 133; Bayfield 134, 147, 150, 151; Douglas 152, 153, 154, 155, 156.

Minnesota - St. Louis 157, 159, 160; Lake 162, 164, 165, 166; Cook 171, 173.

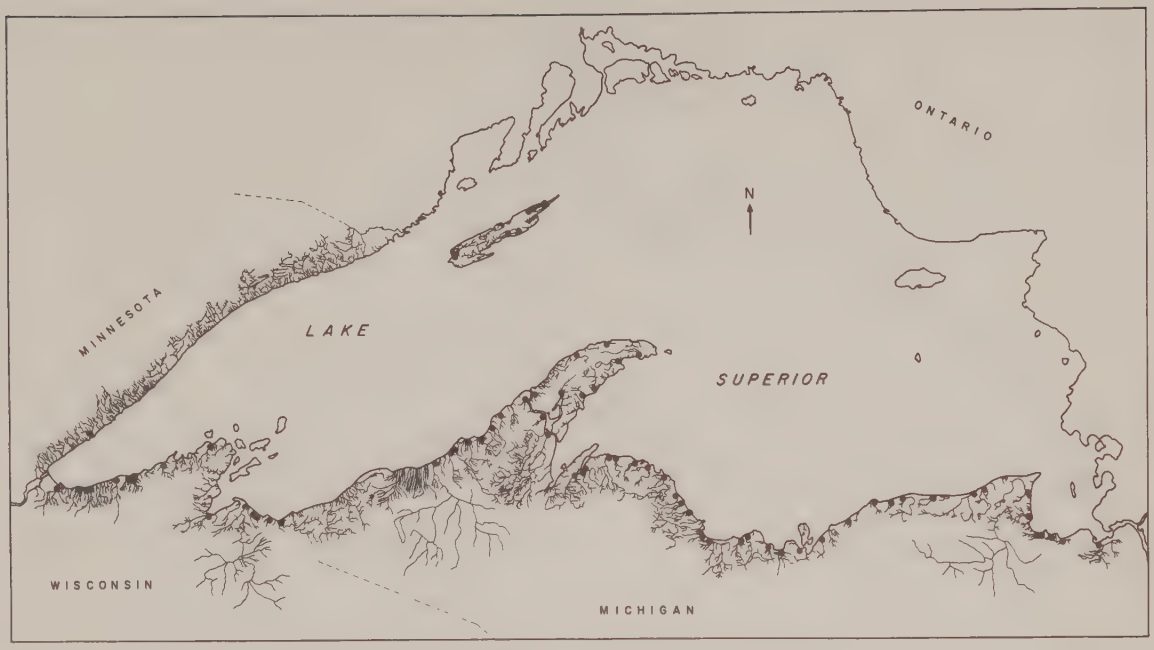

Figure 20.--Longnose dace, Rhinichthys cataractae.

26. Rhinichthys cataractae (Valenciennes), longnose dace (fig. 20)

The longnose dace is common in streams entering Lake Superior. Although the traps at the electric barriers do not retain this species effectively, large numbers of this dace were captured at many barriers.

Records by state and county:

Michigan - Chippewa 1, 3, 5, 7, 8, 12, 14; Luce 18, 19, 20; Alger 21, 22, 23, 26, 28, 33, 35, 36, 39; Marquette 40, 41, 42, 46, 47, 48, 49, 50, 51, 52, 53; Baraga 55, 56, 57; Houghton 64, 66, 67, 70, 85, 89, 91, 92: Keweenaw 71, 72, 74, 77, 81, 122, 123, 125, 126, 127; Ontonagon 94, 95, 96, 97, 99; Gogebic 120.

Wisconsin - Iron 128, 129, 130; Ashland 131; Bayfield 134, 143, 147, 149, 150, 151; Douglas 152, 153, 154, 155, 156.

Minnesota - Lake 162, 166.

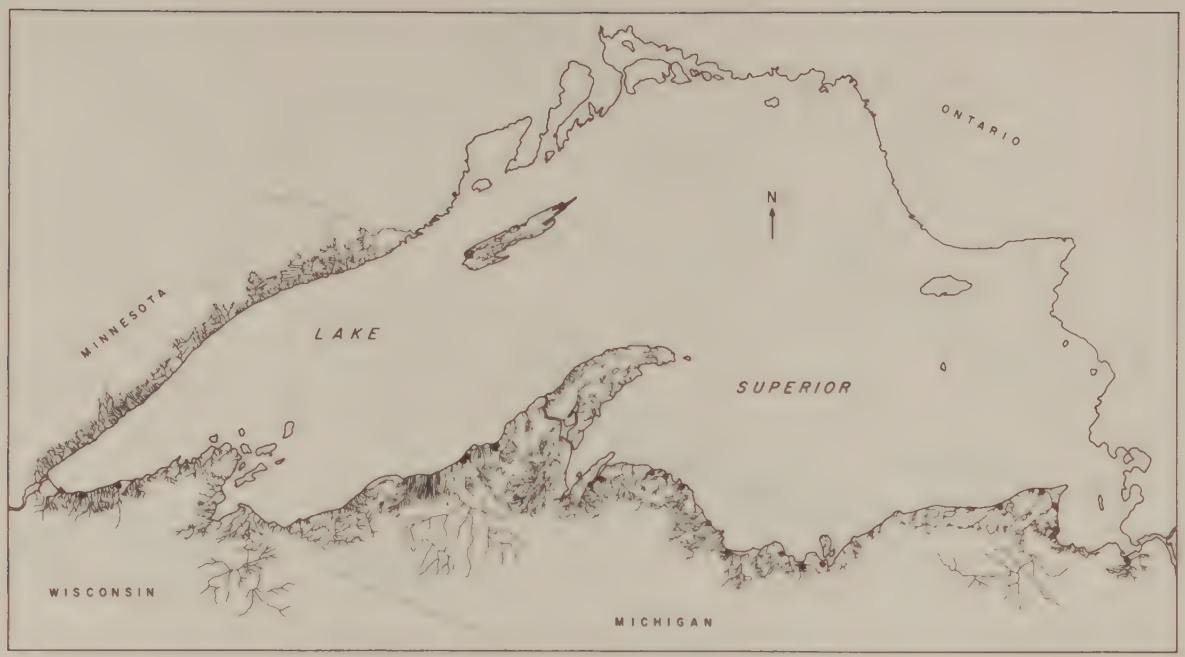

Figure 21.--Finescale dace, Chrosomus neogaeus.

27. Chrosomus neogaeus (Cope), finescale dace (fig. 21)
The finescale dace is distributed throughout the area but was not collected in large numbers.

Records by state and county:

Michigan - Chippewa 1, 11, 12, 14, 16; Luce 19; Alger 33, 35, 37; Marquette 40, 46, 49, 50, 51; Baraga 55, 57; Ontonagon 94, 96, 97.

Wisconsin - Douglas 152, 155.

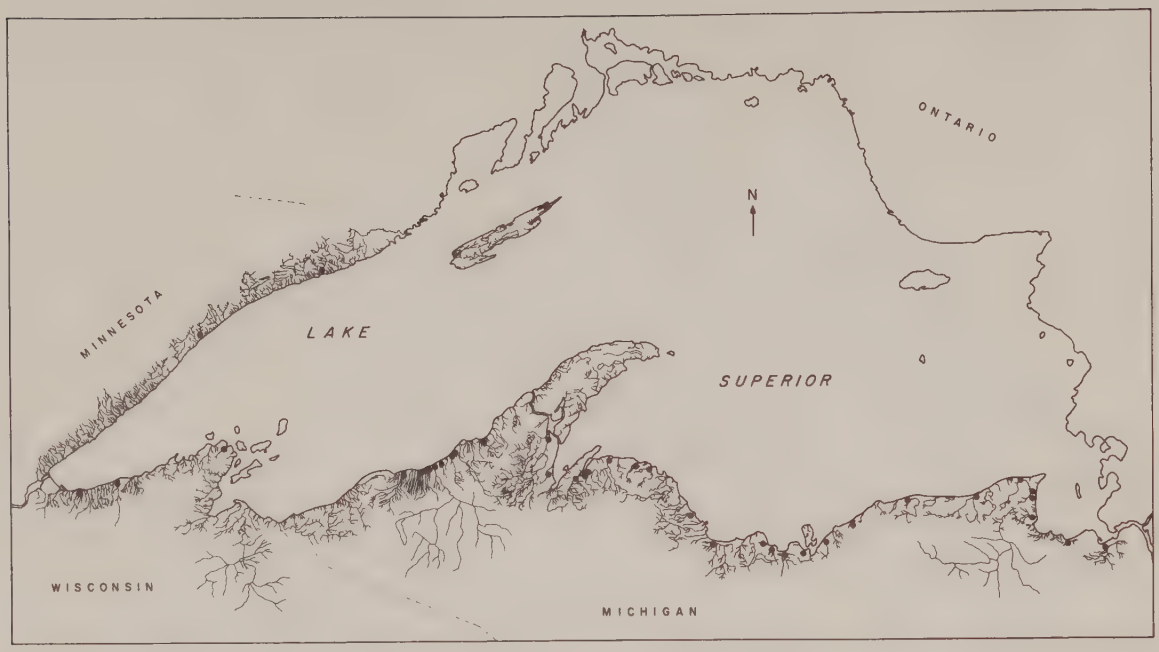

Figure 22.--Northern redbelly dace, Chrosomus eos.

28. Chrosomus eos Cope, northern redbelly dace (fig. 22)

The northern redbelly dace is common in Michigan streams of Lake Superior, but rare in Wisconsin and Minnesota.

Records by state and county;

Michigan - Chippewa 1, 3, 12, 13, 14, 16; Luce 19; Alger 21, 26, 28, 33, 35, 36, 37; Marquette 40, 46, 50, 51, 53; Baraga 55, 56, 57, 62; Houghton 64; Ontonagon 94, 96, 97, 98, 99, 100, 101, 103, 108.

Wisconsin - Bayfield 142; Douglas 152, 155.

Minnesota - Lake 168; Cook 173.

Figure 23.--Golden shiner, Notemigonus crysoleucas.

29. Notemigonus crysoleucas (Mitchill), golden shiner (fig. 23)

Golden shiners are widely distributed in streams of Lake Superior. They were recorded at many electric barriers, but never in quantity.

Records by state and county:

Michigan - Chippewa 1, 12, 14; Luce 18, 19, 20; Alger 21, 33, 35; Marquette 40, 41, 49, 50; Baraga 57; Houghton 64; Ontonagon 94, 96, 97, 99.

Wisconsin - Ashland 131; Bayfield 134, 147, 149, 150; Douglas 152, 153, 154, 155, 156.

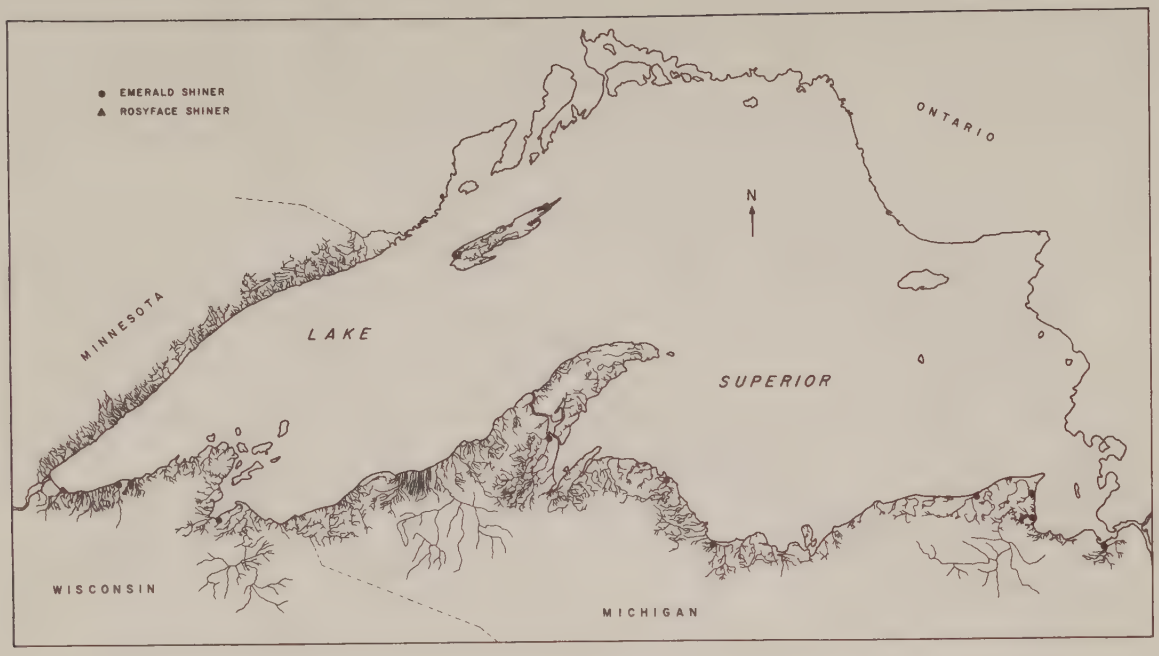

Figure 24.--Emerald shiner, Notropis atherinoides; rosyface shiner, Notropis rubellus.

30. Notropis atherinoides Rafinesque, emerald shiner (fig. 24)

The emerald shiner is a common species of the shoreline of Lake Superior, but was collected rarely in streams.

Records by state and county:

Michigan - Chippewa 1, 12, 14; Luce 19; Marquette 40, 49; Houghton 64.
Wisconsin - Ashland 133; Bayfield 150; Douglas 152.

31. Notropis rubellus (Agassiz), rosyface shiner (fig. 24)

The rosyface shiner was captured in the Tahquamenon River, Chippewa County, Mich. Specimens were captured in fyke nets near the mouth of the stream.

Record by state and county:

Michigan - Chippewa 12.

Figure 25.--Common shiner, Notropis cornutus.

32. Notropis cornutus (Mitchill), common shiner (fig. 25)

This distinctive shiner is common to Lake Superior tributaries and was captured in large numbers in the barrier traps.

Records by state and county:

Michigan - Chippewa 1, 2, 3, 12, 14; Luce 18, 19; Alger 21, 26, 28, 33, 35, 36, 37, 38, 39; Marquette 40, 41, 44, 46, 47, 48, 49, 50, 51, 53; Baraga 55, 56, 57; Houghton 64, 67, 69, 70, 92, 93; Keweenaw 72, 81; Ontonagon 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 108, 111, 112.

Wisconsin - Iron 128; Ashland 131; Bayfield 134, 142, 143, 149, 150, 151; Douglas 152, 153, 154, 155, 156.

Minnesota - St. Louis 157; Lake 162, 163.

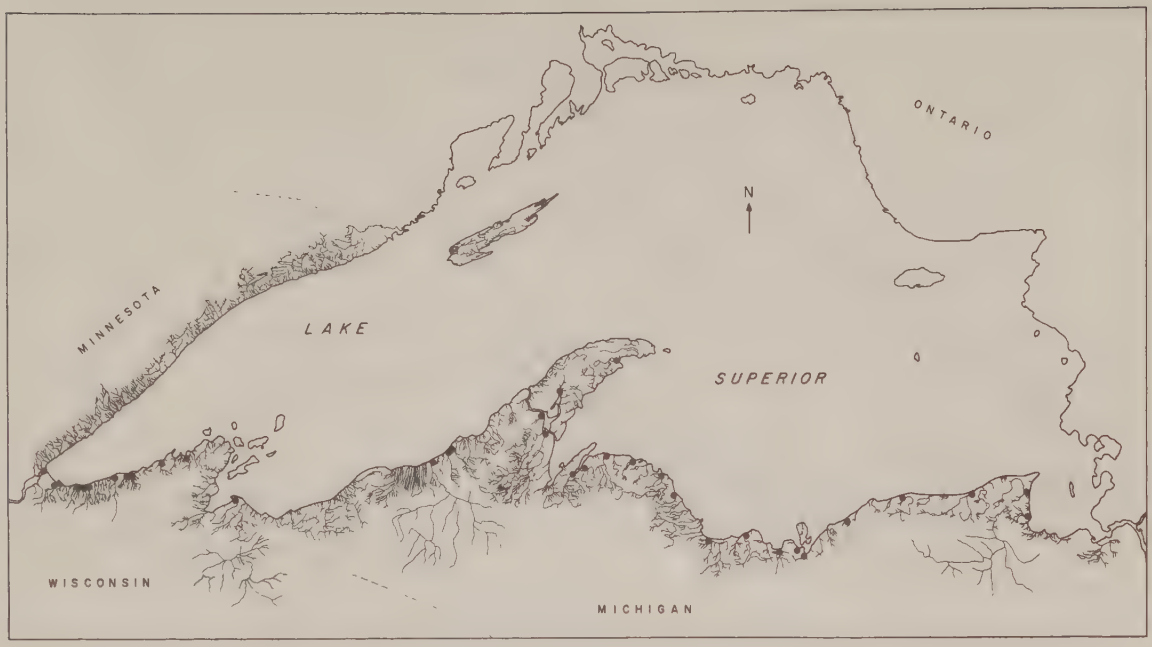

Figure 26.--Spottail shiner, Notropis hudsonius.

33. Notropis hudsonius (Clinton), spottail shiner (fig. 26)

Spottail shiners were collected in many Lake Superior streams. Large numbers were captured at the barrier on the outlet to Beaver Lake.

Records by state and county:

Michigan - Chippewa 12, 14; Luce 19; Alger 21, 26, 31, 33, 35, 38; Marquette 40, 48, 49, 51, 53; Baraga 55, 57; Houghton 64, 66, 67; Keweenaw 72; Ontonagon 96, 97, 99.

Wisconsin - Ashland 132; Bayfield 144, 147, 149, 150, 151; Douglas 152, 153, 154, 155, 156.

Minnesota - St. Louis 157.

Figure 27.--Blackchin shiner, Notropis heterodon; bigmouth shiner, Notropis dorsalis; mimic shiner, Notropis volucellus.

34. Notropis heterodon (Cope), blackchin shiner (fig. 27)
Blackchin shiners were collected from six streams of eastern Lake Superior.

Records by state and county:
Michigan - Chippewa 1, 14; Luce 19, 20; Alger 35; Marquette 49.

35. Notropis dorsalis (Agassiz), bigmouth shiner (fig. 27)
Bigmouth shiners were captured in the Otter River, a tributary of the Sturgeon River, Houghton County, Mich. The only specimens taken were captured in fyke nets.

Record by state and county:
Michigan - Houghton 64.

37. Notropis volucellus (Cope), mimic shiner (fig. 27)
The mimic shiner was found in the larger rivers of Lake Superior's south shore.

Records by state and county:
Michigan - Chippewa 12, 14; Alger 35; Marquette 49, 51; Ontonagon 96.
Wisconsin - Ashland 131; Douglas 155.

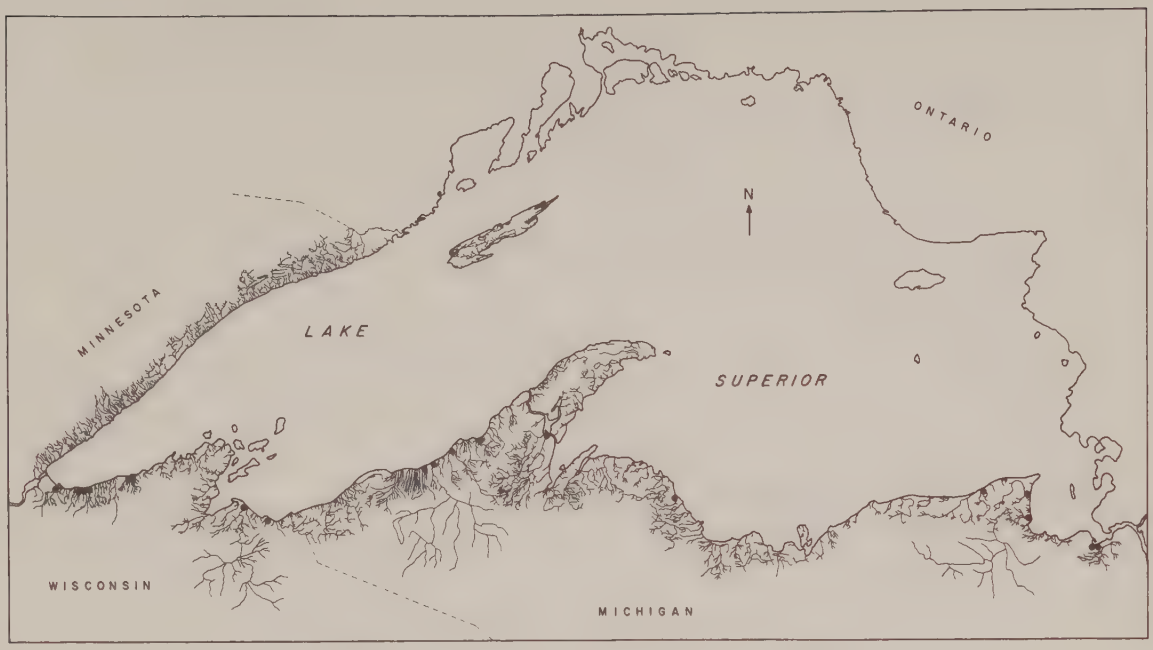

Figure 28.--Sand shiner, Notropis stramineus.

36. Notropis stramineus (Cope), sand shiner (fig. 28)
Sand shiners were widely distributed but abundant only in larger streams.

Records by state and county:

Michigan - Chippewa 1, 2, 12, 14; Luce 18; Marquette 48; Houghton 64; Ontonagon 94, 96, 99, 102.

Wisconsin - Iron 128; Ashland 131; Bayfield 150, 151; Douglas 153, 154, 155, 156.

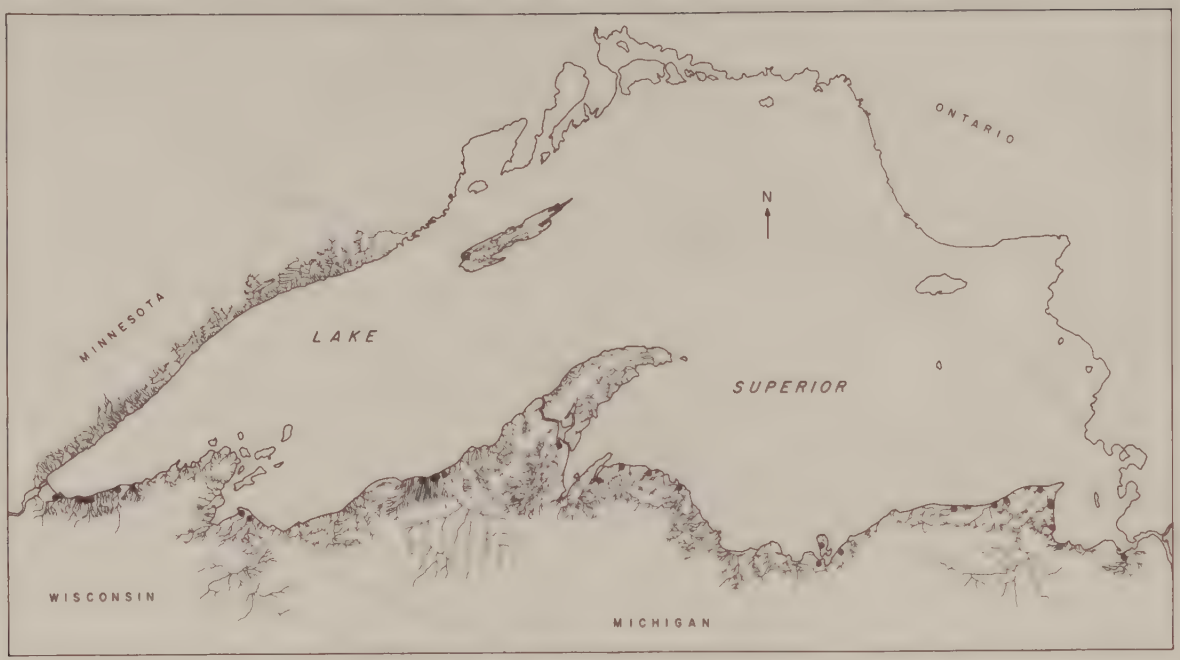

Figure 29.--Blacknose shiner, Notropis heterolepis.

38. Notropis heterolepis Eigenmann and Eigenmann, blacknose shiner (fig. 29)

Blacknose shiners were collected in many streams but were common only in streams of eastern Lake Superior.

Records by state and county:

Michigan - Chippewa 1, 8, 12, 13, 14, 16; Luce 18, 19, 20; Alger 28, 32, 33; Marquette 49, 51, 53; Baraga 55; Houghton 64; Ontonagon 99, 101, 102, 107.

Wisconsin - Ashland 131, 132; Bayfield 151; Douglas 152, 153, 154, 155, 156.

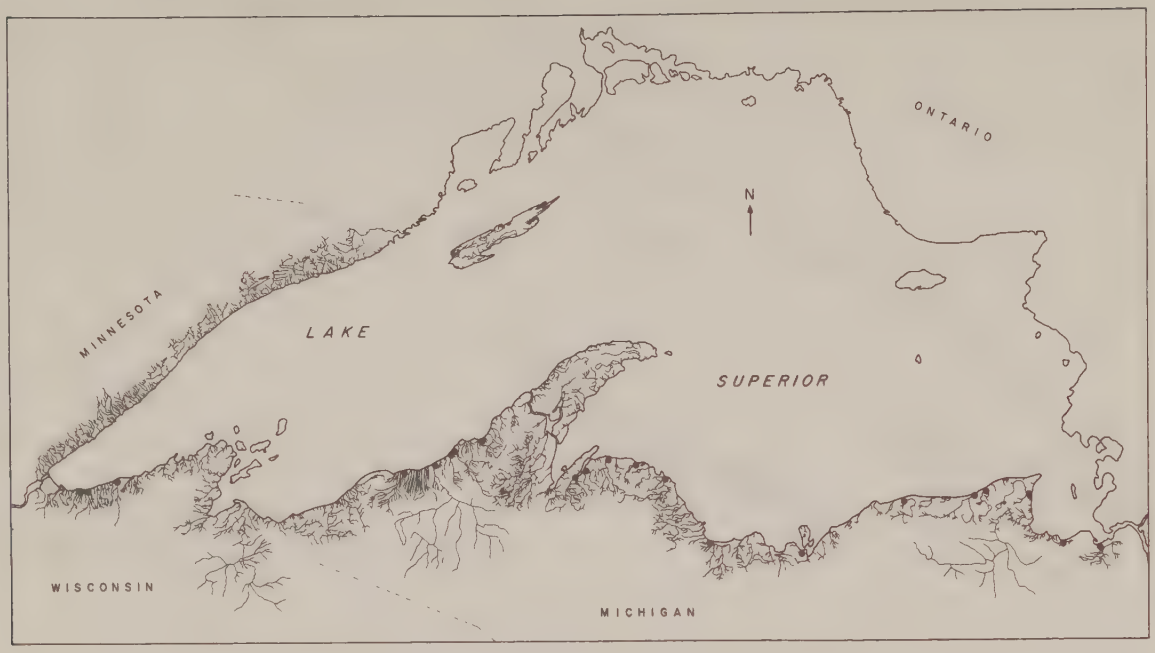

Figure 30.--Brassy minnow, Hybognathus hankinsoni.

39. Hybognathus hankinsoni Hubbs, brassy minnow (fig. 30)
This species, although distributed widely, was collected in small numbers.

Records by state and county:
Michigan - Chippewa 1, 3, 14; Luce 18, 19; Alger 21, 33; Marquette 40, 49, 51, 53; Baraga 55, 57; Ontonagon 94, 96, 97, 99, 108.
Wisconsin - Douglas 152, 154, 155.

Figure 31.--Fathead minnow, Pimephales promelas.

40. Pimephales promelas Rafinesque, fathead minnow (fig. 31)
Fathead minnows are widespread but are abundant only in a few localities.

Records by state and county:

Michigan - Chippewa 1, 3, 12, 14; Luce 19, 20; Alger 21, 39; Marquette 40, 49, 51; Baraga 55, 57; Houghton 64; Ontonagon 96, 99, 100, 101, 102, 103, 108, 112.

Wisconsin - Ashland 131; Bayfield 147, 150, 151; Douglas 152, 153, 154, 155.

Minnesota - St. Louis 159; Lake 166; Cook 173.

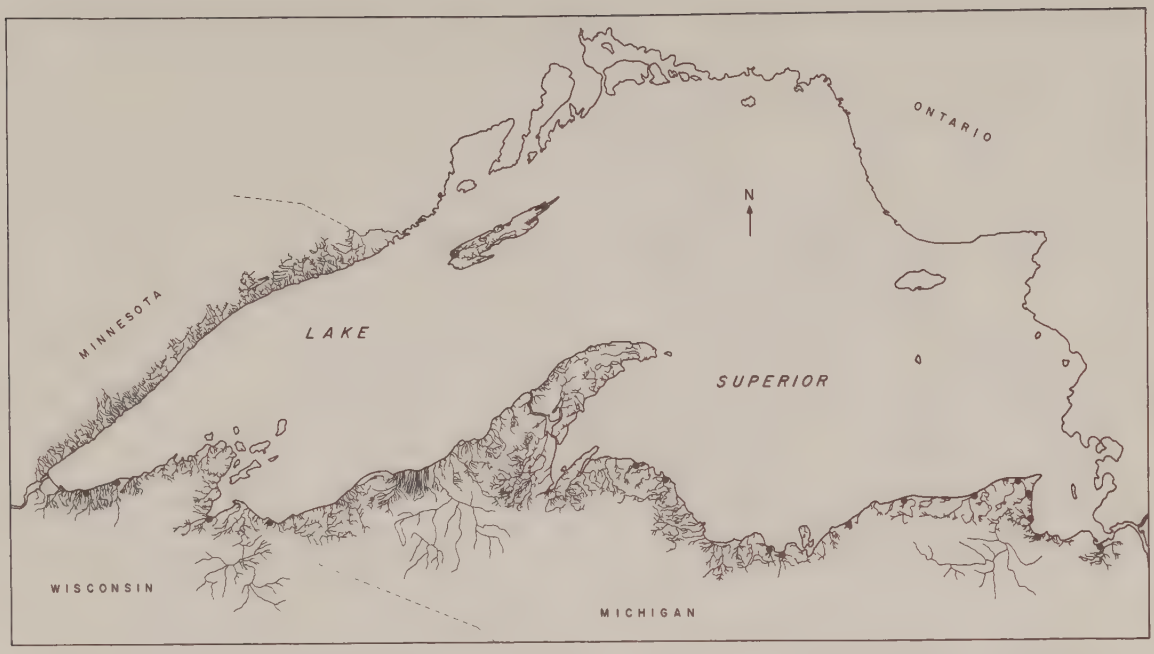

Figure 32.--Bluntnose minnow, Pimephales notatus.

41. Pimephales notatus (Rafinesque), bluntnose minnow (fig. 32)
The bluntnose minnow was found in 16 streams, and it was abundant in most of these streams.

Records by state and county:
Michigan - Chippewa 1, 8, 12, 14, 16; Luce 19; Alger 21, 26, 35, 36; Marquette 49, 51.
Wisconsin - Iron 128; Bayfield 134; Douglas 152, 154.

Figure 33.--White sucker, Catostomus commersoni.

42. Catostomus commersoni (Lacépède), white sucker (fig. 33)

The white sucker is common in Lake Superior streams. Large numbers of adults migrate from the lake to spawn each spring. White suckers are found in streams throughout the year.

Records by state and county:

Michigan - Chippewa 1, 3, 5, 8, 12, 13, 14; Luce 18, 19, 20; Alger 21, 22, 23, 26, 28, 29, 31, 32, 33, 35, 36, 37, 38, 39; Marquette 40, 41, 44, 46, 47, 48, 49, 50, 51, 52, 53; Baraga 55, 56, 57, 60; Houghton 64, 66, 67, 70, 85, 89, 91, 92; Keweenaw 71, 72, 74, 77, 81, 82, 122, 125, 126, 127; Ontonagon 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 108, 112; Gogebic 120.

Wisconsin - Iron 128, 130; Ashland 131, 133; Bayfield 134, 142, 143, 144, 145, 147, 149, 150, 151; Douglas 152, 153, 154, 155, 156.

Minnesota - St. Louis 157; Lake 162, 163, 165, 166; Cook 174.

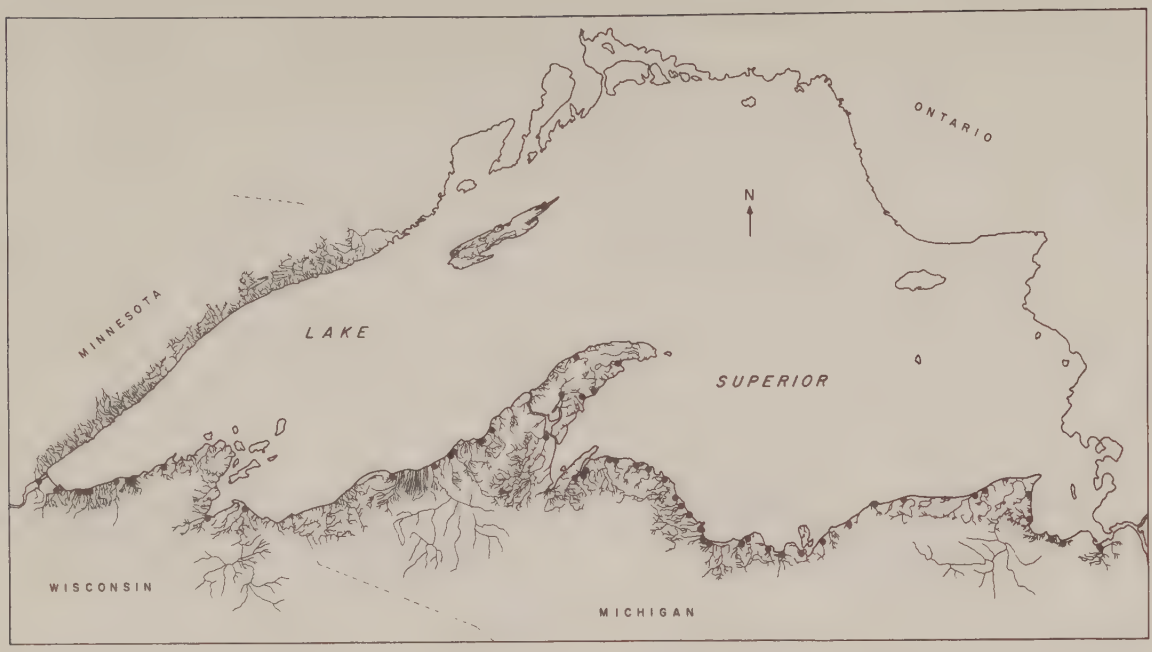

Figure 34.--Longnose sucker, Catostomus catostomus.

43. Catostomus catostomus (Forster), longnose sucker (fig. 34)

Large numbers of adult longnose suckers ascend the streams of Lake Superior each spring to spawn. The barrier traps cannot accommodate the numbers moving during the peak of the run. Brule River, Douglas County, Wis., was the only stream in which large numbers of small longnose suckers (under 10 inches) were captured.

Records by state and county:

Michigan - Chippewa 1, 3, 5, 12, 14; Luce 18, 19; Alger 21, 23, 26, 28, 33, 35, 36, 38, 39; Marquette 40, 41, 44, 46, 47, 48, 49, 50, 51, 52, 53; Baraga 55, 56, 57; Houghton 64, 67, 70, 92; Keweenaw 71, 72, 81; Ontonagon 94, 96, 97, 99, 112.

Wisconsin - Ashland 131; Bayfield 134, 147, 149, 150, 151; Douglas 152, 153, 154, 155, 156.

Minnesota - St. Louis 157.

Figure 35.--Silver redhorse, Moxostoma anisurum; northern redhorse, Moxostoma macrolepidotum.

44. Moxostoma anisurum (Rafinesque), silver redhorse (fig. 35)

The sliver redhorse is found in the larger south-shore streams. Small numbers of this species were captured in the barrier traps.

Records by state and county:

Michigan - Chippewa 1, 12; Houghton 64; Ontonagon 96.
Wisconsin - Ashland 131; Douglas 152, 155, 156.

45. Moxostoma macrolepidotum (Lesueur), northern redhorse (fig. 35)

Northern redhorse suckers were captured in seven streams. They were very abundant in the Sturgeon River, Houghton County, Mich., and the Bad River, Ashland County, Wis.

Records by state and county:

Michigan - Houghton 64.
Wisconsin - Ashland 131; Bayfield 149; Douglas 152, 154, 155, 156.

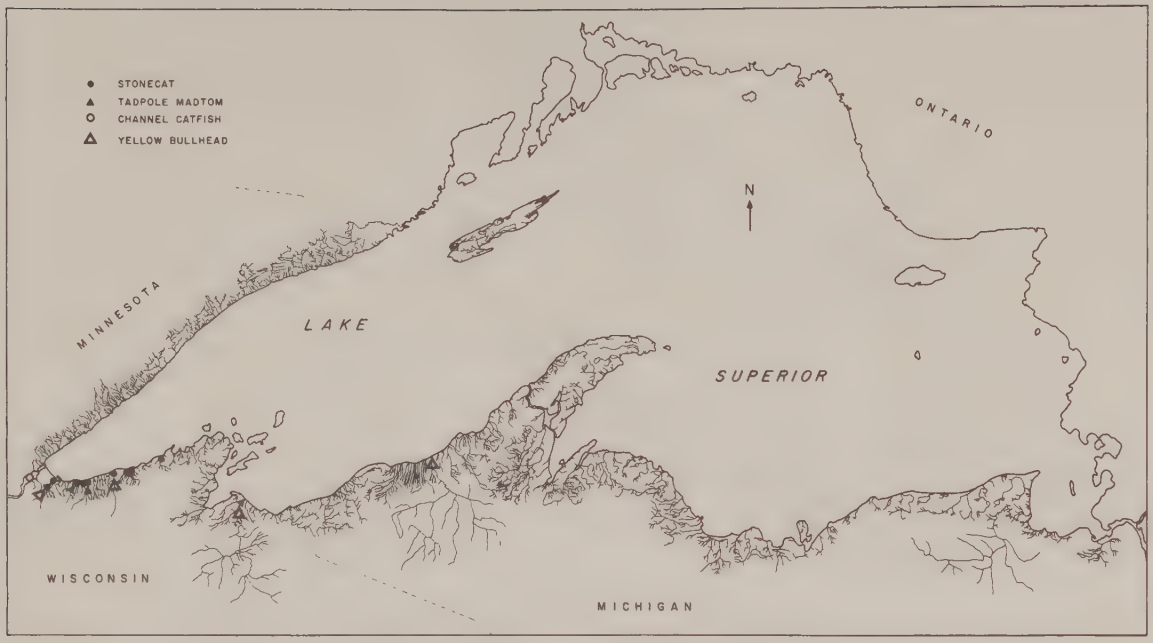

Figure 36.--Channel catfish, Ictalurus punctatus; yellow bullhead, Ictalurus natalis; stonecat, Noturus flavus; tadpole madtom, Noturus gyrinus.

46. Ictalurus punctatus (Rafinesque), channel catfish (fig. 36)
One channel catfish was captured in a fyke net on the St. Louis River.

Record by state and county:
Minnesota - St. Louis 157.

49. Ictalurus natalis (Lesueur), yellow bullhead (fig. 36)
The yellow bullhead was collected from four larger streams of Lake Superior.

Records by state and county:
Michigan - Ontonagon 99.
Wisconsin - Ashland 131; Douglas 152, 156.

50. Noturus flavus Rafinesque, stonecat (fig. 36)
Stonecats are limited to Lake Superior tributaries in Bayfield and Douglas Counties, Wis. They are common in these streams.

Records by state and county:
Wisconsin - Bayfield 147, 149, 150, 151; Douglas 152, 153, 154, 155, 156.

51. Noturus gyrinus (Mitchill), tadpole madtom (fig. 36)
Tadpole madtoms were captured in four Lake Superior streams of Wisconsin. Most collected specimens came from fall fyke nets.

Records by state and county:
Wisconsin - Ashland 131; Douglas 153, 155, 156.

Figure 37.--Black bullhead, Ictalurus melas.

47. Ictalurus melas (Rafinesque), black bullhead (fig. 37)

Black bullheads are well established in Lake Superior streams. This species reaches its greatest abundance in streams of western Lake Superior.

Records by state and county:

Michigan - Chippewa 12; Luce 19; Alger 26, 35; Marquette 40, 46; Baraga 55, 57; Houghton 64, 92; Ontonagon 94.

Wisconsin - Ashland 131, 132; Bayfield 134, 150, 151; Douglas 152, 153, 154, 155, 156.

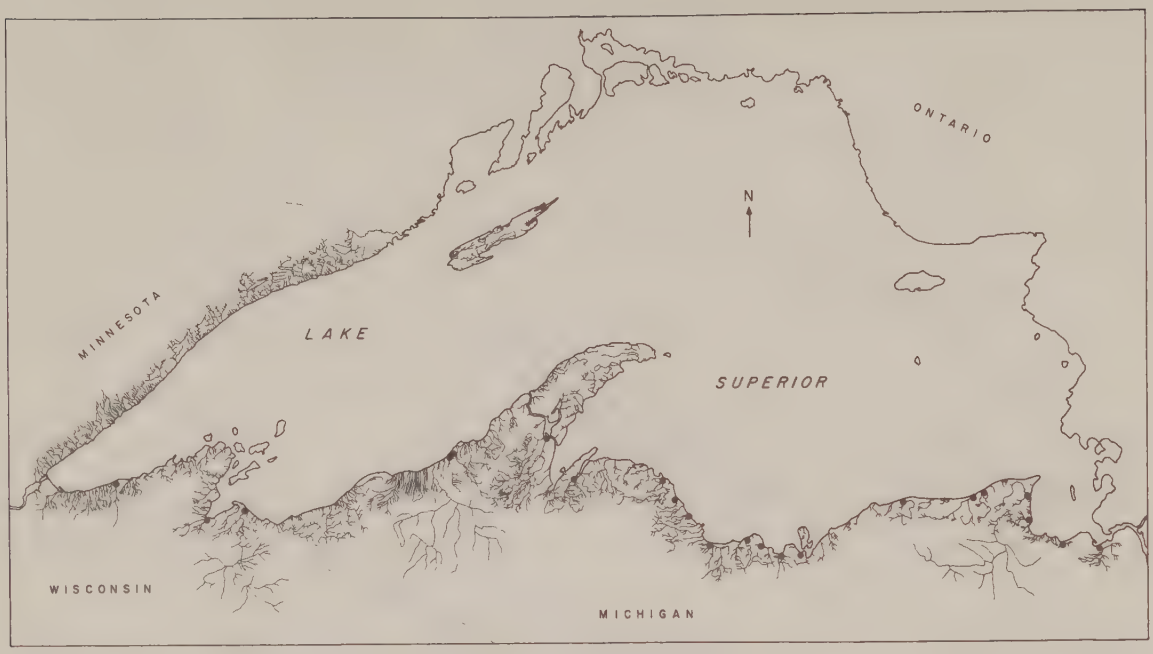

Figure 38.--Brown bullhead, Ictalurus nebulosus.

48. Ictalurus nebulosus (Lesueur), brown bullhead (fig. 38)

The brown bullhead is common in Lake Superior tributaries. The barrier catches of this species have fluctuated widely from one year to the next. The catch on the Au Train River varied from 4 individuals in 1954 to more than 10,000 in 1959. This wide variation in the catch of brown bullheads has characterized many Lake Superior streams.

Records by state and county:

Michigan - Chippewa 1, 3, 12, 14; Luce 18, 19; Alger 21, 33, 35, 37, 38; Marquette 40, 46, 48, 49; Baraga 57; Houghton 64; Ontonagon 96, 97.

Wisconsin - Ashland 131; Bayfield 134; Douglas 152.

Figure 39.--American eel, Anguilla rostrata; banded killifish, Fundulus diaphanus; burbot, Lota lota.

52. Anguilla rostrata (Lesueur), American eel (fig. 39)

One American eel was captured July 21, 1957, at the barrier on Beaver Lake Creek. It was 406 mm. long and weighed 102 gram.

Record by state and county:

Michigan - Alger 26.

53. Fundulus diaphanus (Lesueur), banded killifish (fig. 39)

The banded killifish was collected from Pendills Creek on Lake Superior. This species is restricted to an inland lake in the upper portion of this stream.

Record by state and county:

Michigan - Chippewa 3.

54. Lota lota (Linnaeus), burbot (fig. 39)

Burbot are common in tributary streams of Lake Superior. They were collected in limited numbers in the barrier traps. Small burbot were frequently in fyke nets.

Records by state and county:

Michigan - Chippewa 1, 3, 5, 14; Luce 18, 19, 20; Alger 21, 28 29, 33, 35, 38, 39; Marquette 40, 46, 49, 50, 51, 53; Baraga 55, 57; Houghton 64, 66, 67, 70, 85, 89, 91, 92; Keweenaw 72, 74, 77, 81; Ontonagon 94, 96, 97, 101, 102, 106; Gogebic 120.

Wisconsin - Ashland 131; Bayfield 134, 147; Douglas 152, 153, 154, 155, 156.

Minnesota - St. Louis 157; Cook 172.

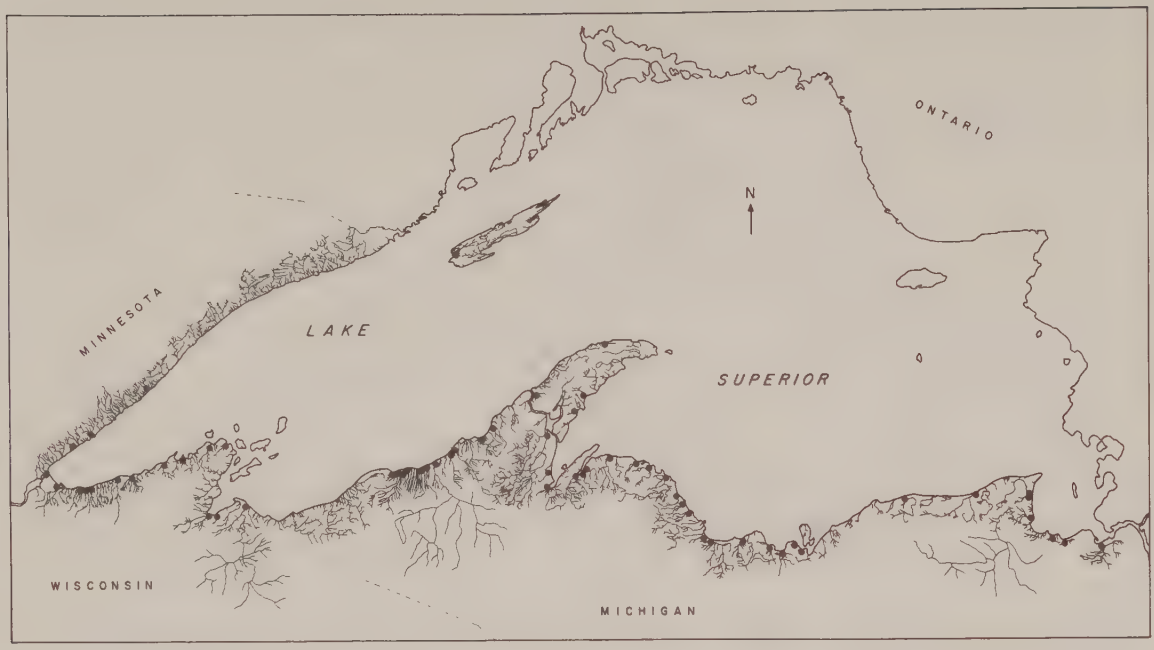

Figure 40.--Brook stickleback, Eucalia inconstans.

55. Eucalia inconstans (Kirtland), brook stickleback (fig. 40)
The brook stickleback was captured in most south-shore streams of Lake Superior.

Records by state and county:

Michigan - Chippewa 1, 3, 5, 12, 13, 14; Luce 19; Alger 21, 33, 34, 35, 36, 39; Marquette 40, 41, 46, 47, 48, 49, 50, 51, 53; Baraga 55, 56, 57, 61, 62; Houghton 64, 69, 70, 85, 92; Keweenaw 77, 127; Ontonagon 94, 96, 97, 99, 102, 104, 107, 108, 110, 112.

Wisconsin - Ashland 131, 133; Bayfield 134, 142, 143, 145, 147, 150; Douglas 152, 153, 154, 155, 156.

Minnesota - St. Louis 157, 159; Lake 162, 166.

Figure 41.--Ninespine stickleback, Pungitius pungitius.

56. Pungitius pungitius (Linnaeus), ninespine stickleback (fig. 41)

The ninespine stickleback is common to the shoal areas of Lake Superior. It was encountered in a relatively few streams scattered along the entire south shore. This fish is too small to retain in the traps.

It is not uncommon in the spring and early summer to find this species a considerable distance upstream from Lake Superior. The weir on the Chocolay River, Marquette County, Mich., is about 15 miles above the mouth of the stream, but 64 ninespine sticklebacks were captured at this weir in 1962.

Records by state and county:

Michigan - Chippewa 1, 3, 14; Luce 19; Alger 21, 28, 31, 33; Marquette 40, 41, 44, 46, 49, 50, 51; Baraga 57; Houghton 92; Ontonagon 96, 97, 112.

Wisconsin - Douglas 152, 153, 154.

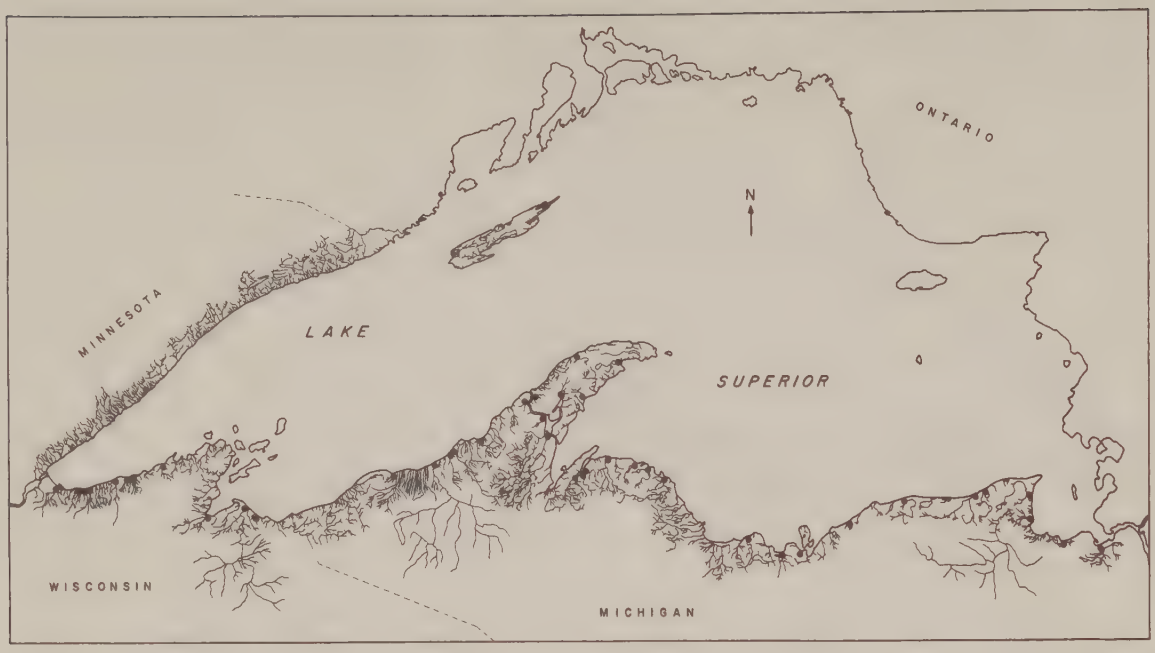

Figure 42.---Trout-perch, Percopsis omiscomaycus.

57. Percopsis omiscomaycus (Walbaum), trout-perch (fig. 42)

Trout-perch are widespread in Lake Superior streams and may be extremely abundant. In 1954, more than 40,000 trout-perch were captured and moved above the barrier on the Little Gratiot River in Keweenaw County, Mich.

Records by state and county:

Michigan - Chippewa 1, 3, 12, 14; Luce 18, 19; Alger 21, 26, 33, 35, 38; Marquette 49, 50, 51, 53; Baraga 55, 56, 57; Houghton 64, 66, 67, 70, 85, 89; Keweenaw 72, 81; Ontonagon 94, 96, 97, 99, 112.

Wisconsin - Iron 129; Ashland 131; Bayfield 134, 147, 149, 150, 151; Douglas 152, 153, 154, 155, 156.

Minnesota - Lake 166.

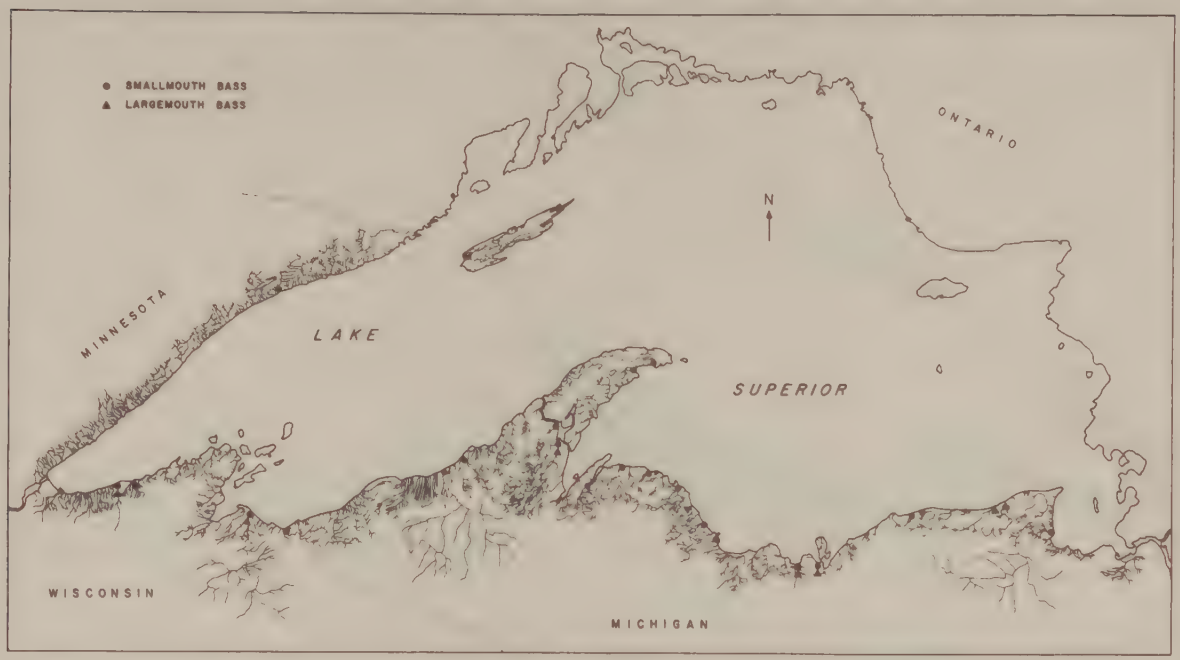

Figure 43.--Smallmouth bass, Micropterus dolomieui; largemouth bass, Micropterus salmoides.

58. Micropterus dolomieui Lacépède, smallmouth bass (fig. 43)

The smallmouth bass is widely distributed in Lake Superior streams, but only few were collected.

Records by state and county:

Michigan - Chippewa 12; Alger 21, 22, 33, 35; Marquette 44, 46, 49, 51, 53; Baraga 57; Houghton 64, 66; Keweenaw 72, 74; Ontonagon 96, 99; Gogebic 120.

Wisconsin - Ashland 131; Douglas 152, 154.

Minnesota - Cook 171.

59. Micropterus salmoides (Lacépède), largemouth bass (fig. 43)

The largemouth bass was captured in nine streams. Most records are of small fingerlings caught in fyke nets.

Records by state and county:

Michigan - Luce 18, 19; Alger 33, 35; Marquette 48; Houghton 64.

Wisconsin - Ashland 131; Bayfield 149; Douglas 152.

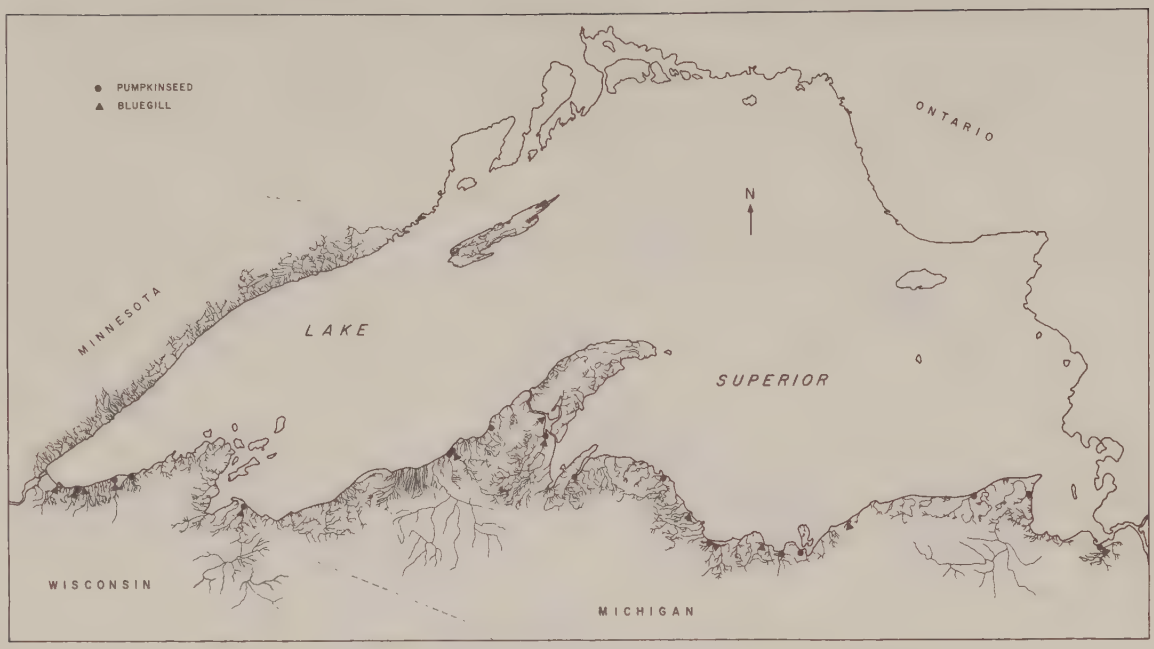

Figure 44.--Pumpkinseed, Lepomis gibbosus; bluegill, Lepomis macrochirus.

60. Lepomis gibbosus (Linnaeus), pumpkinseed (fig. 44)

Pumpkinseeds were captured in 16 streams tributary to Lake Superior, but were common only in the Au Train River, Alger County, and the Chocolay River, Marquette County, Mich.

Records by state and county:

Michigan - Chippewa 1, 14; Luce 19; Alger 33, 35; Marquette 40, 49; Baraga 57; Houghton 64, 92; Ontonagon 96, 97.

Wisconsin - Ashland 131; Bayfield 149; Douglas 152, 155.

61. Lepomis macrochirus Rafinesque, bluegill (fig. 44)

Bluegills are found infrequently in streams in this area. They occur most often in rivers that flow from or through lakes.

Records by state and county:

Michigan - Chippewa 1; Alger 26, 37; Marquette 40, 46; Houghton 64, 66; Ontonagon 96.

Wisconsin - Ashland 131; Douglas 152, 154, 155, 156.

Figure 45.--Rock bass, Ambloplites rupestris; black crappie, Pomoxis nigromaculatus.

62. Ambloplites rupestris (Rafinesque), rock bass (fig. 45)

The rock bass is distributed widely in south-shore streams of Lake Superior, but the total number collected was small.

Records by state and county:

Michigan - Chippewa 1, 3, 12, 14; Luce 18, 19, 20; Alger 21, 22, 26, 33, 35, 38; Marquette 40, 41, 44, 46, 48, 49, 50, 51, 53; Baraga 55, 57; Houghton 64, 67, 69, 70; Keweenaw 72, 81; Ontonagon 94, 96, 97, 99, 102, 106, 111.

Wisconsin - Ashland 131; Bayfield 134, 143, 150, 151; Douglas 152, 153, 154, 155, 156.

63. Pomoxis nigromaculatus (Lesueur), black crappie (fig. 45)

We have few records of black crappie. They were collected in small numbers from the larger streams and from streams with lakes in their systems.

Records by state and county:

Michigan - Houghton 64; Ontonagon 99.

Wisconson - Ashland 131; Bayfield 149, 150; Douglas 152, 154, 155.

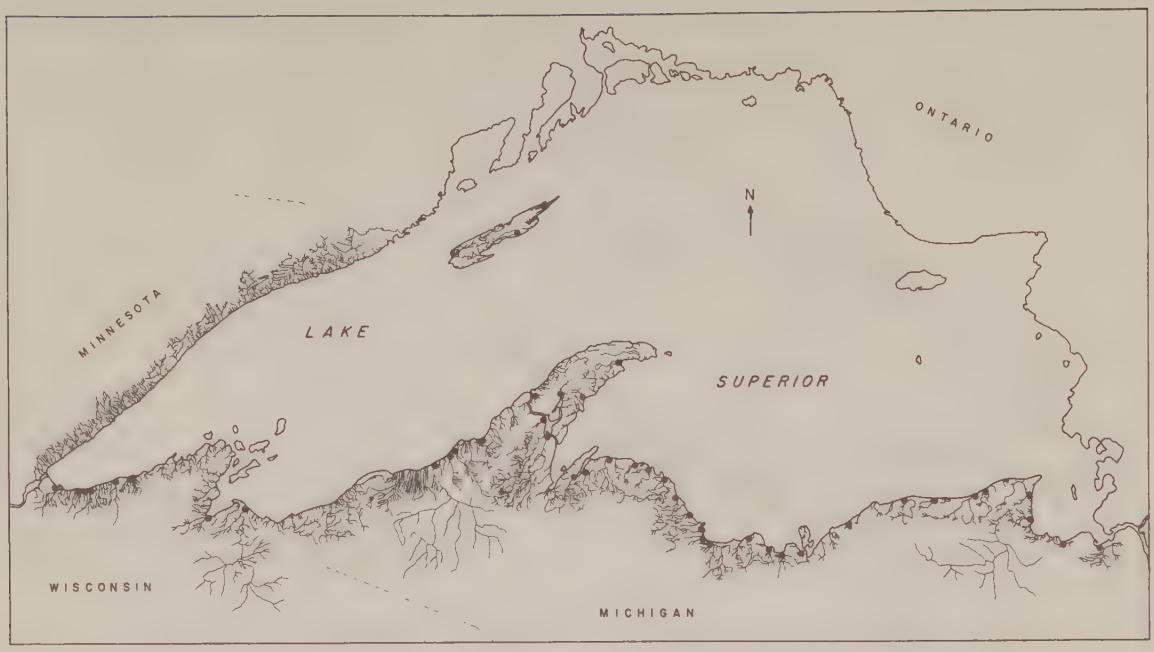

Figure 46.--Yellow perch, Perca flavescens.

64. Perca flavescens (Mitchill), yellow perch (fig. 46)

Yellow perch were common in the streams of the south shore of Lake Superior, but they generally appeared in small numbers at the barriers. The largest catches were from streams with lakes in their systems.

Records by state and county:

Michigan - Chippewa 1, 3, 12, 14; Luce 18, 19, 20; Alger 21, 26, 33, 35, 36, 38; Marquette 40, 41, 44, 46, 48, 49, 50, 51, 53; Baraga 55, 57; Houghton 64, 66, 67, 70, 85; Keweenaw 72, 125; Ontonagon 94, 96, 97, 99.

Wisconsin - Ashland 131; Bayfield 134, 149, 150; Douglas 152, 153, 154, 155, 156.

Figure 47.--Walleye, Stizostedion vitreum vitreum; blackside darter, Percina maculata.

65. Stizostedion vitreum vitreum (Mitchill), walleye (fig. 47)
Walleye are common in the larger streams of Lake Superior.

Records by state and county:
Michigan - Chippewa 1; Alger 33, 35; Marquette 44, 46, 48, 49, 51; Baraga 57; Houghton 64; Keweenaw 72; Ontonagon 94, 96, 99.
Wisconsin - Ashland 131; Douglas 152, 153, 154, 155, 156.
Minnesota - St. Louis 157; Cook 174.

66. Percina maculata (Girard), blackside darter (fig. 47)
The blackside darter was collected from the Tahquamenon and Betsy Rivers, Chippewa County, Mich.

Records by state and county:
Michigan - Chippewa 12, 14.

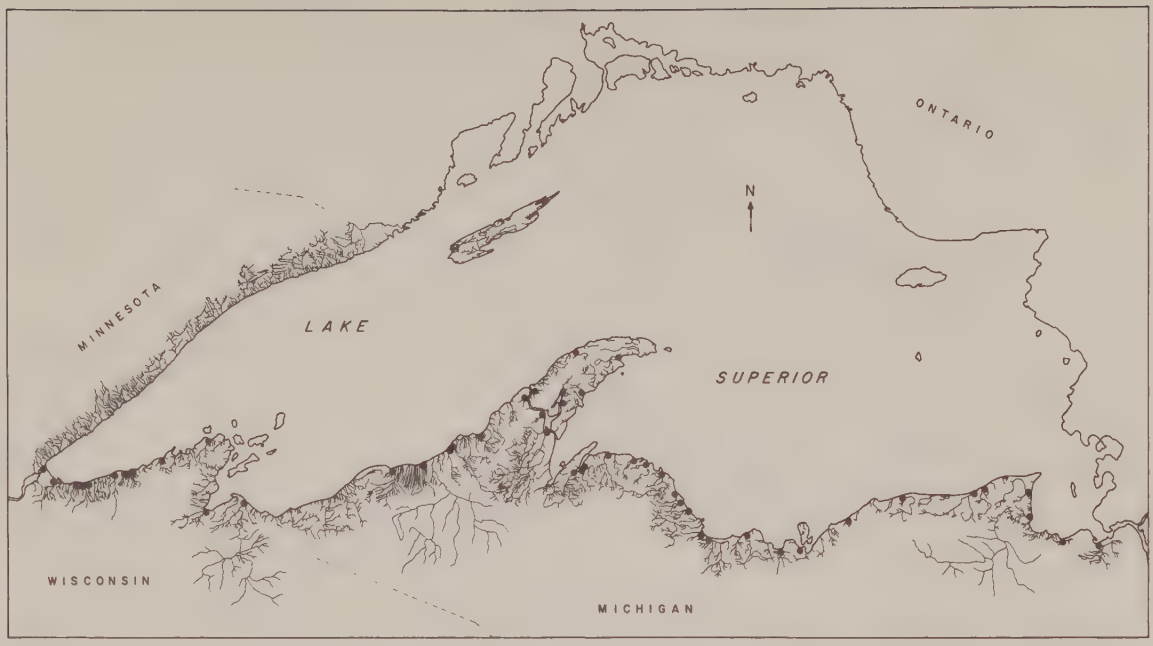

Figure 48.--Logperch, Percina caprodes.

67. Percina caprodes (Rafinesque), logperch (fig. 48)

Logperch are common in south-shore streams of Lake Superior. The small size of this species allows it to swim through the mesh of the barrier traps; large numbers were handled, nevertheless, at many weirs.

Records by state and county:

Michigan - Chippewa 1, 3, 12, 14; Luce 18, 19; Alger 21, 26, 33, 35, 38; Marquette 40, 41, 46, 47, 48, 49, 50, 51, 53; Baraga 55, 56, 57; Houghton 64, 66, 67, 68, 70, 85, 89; Keweenaw 72, 81; Ontonagon 94, 96, 97, 102, 112.

Wisconsin - Ashland 131; Bayfield 134, 143, 147, 149, 150, 151; Douglas 152, 153, 154, 155, 156.

Minnesota - St. Louis 157.

Figure 49.--Johnny darter, Etheostoma nigrum.

68. Etheostoma nigrum Rafinesque, Johnny darter (fig. 49)

The Johnny darter is common in the streams of the south shore of Lake Superior.

Records by state and county:

Michigan - Chippewa 1, 2, 7, 12, 14; Luce 18, 19, 20; Alger 21, 26, 33, 35, 37, 39; Marquette 46, 47, 48, 49, 50, 51, 53; Baraga 55, 56, 57; Houghton 64, 66, 69, 92; Keweenaw 74; Ontonagon 94, 95, 96, 97, 98, 99, 101, 102, 103, 104, 105, 106, 107, 108, 110, 111, 112; Gogebic 120.

Wisconsin - Iron 128; Ashland 131, 132; Bayfield 134, 142, 143, 144, 147, 148, 149, 150, 151; Douglas 152, 153, 154, 155, 156.

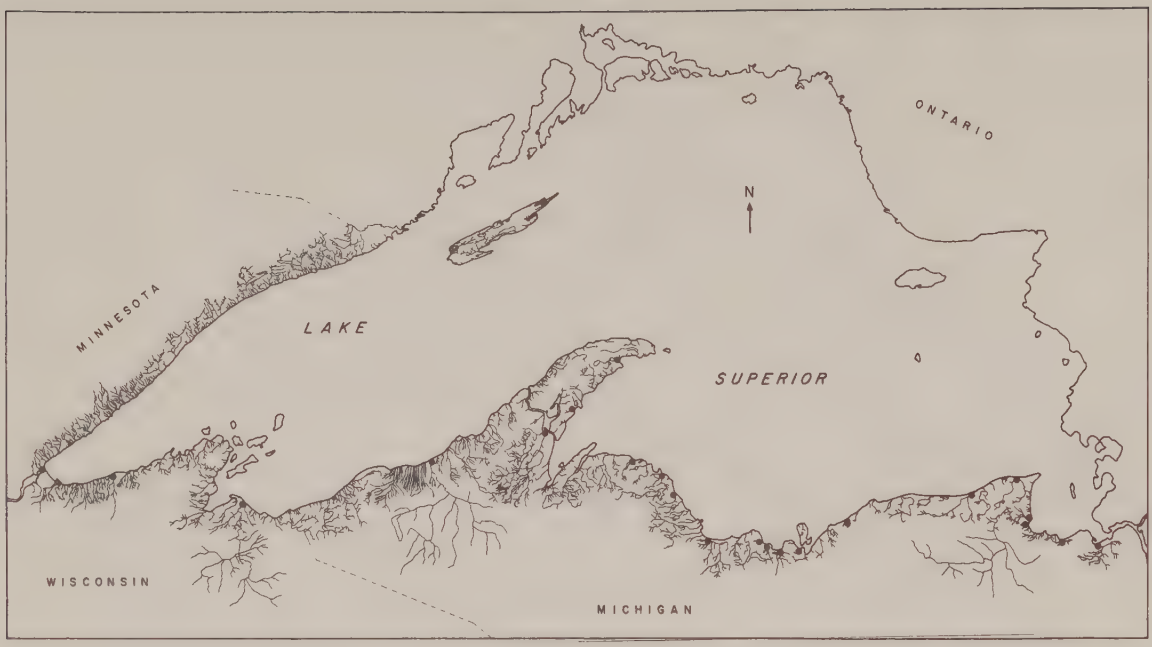

Figure 50.--Iowa darter, Etheostoma exile.

69. Etheostoma exile (Girard), Iowa darter (fig. 50)
The Iowa darter is common in streams of eastern Lake Superior.

Records by state and county:

Michigan - Chippewa 1, 3, 11, 12, 16; Luce 19; Alger 26, 33, 35, 36, 37; Marquette 40, 48, 49, 51; Houghton 64, 69; Keweenaw 72; Ontonagon 99.

Wisconsin - Ashland 131; Douglas 152.

Minnesota - St. Louis 157.

Figure 51.--Mottled sculpin, Cottus bairdi.

70. Cottus bairdi Girard, mottled sculpin (fig. 51)

The mottled sculpin is one of the common stream-dwelling fish in this area. It was found throughout the river systems and was one of the more common fish in survey collections.

Records by state and county:

Michigan - Chippewa 1, 2, 3, 5, 6, 12, 13, 14; Luce 18, 19; Alger 21, 26, 28, 31, 33, 34, 35, 36, 37, 38, 39; Marquette 40, 46, 47, 49, 50, 51, 53; Baraga 55, 56,57, 60; Houghton 66, 70; Keweenaw 77, 122, 123, 125; Ontonagon 94, 95, 96, 97, 98, 99, 101, 102, 103, 104, 105, 106, 112.

Wisconsin - Iron 128, 129; Ashland 131; Bayfield 142, 143, 144, 145, 146, 147, 148, 149, 150, 151; Douglas 152, 153, 154, 155, 156.

Minnesota - Lake 166.

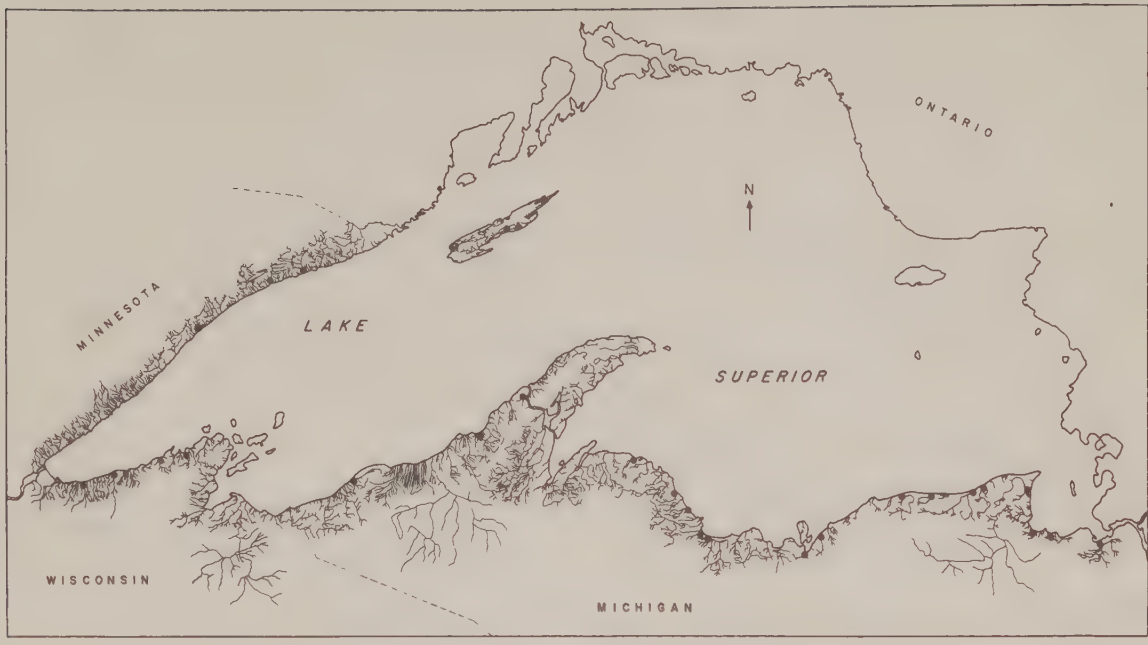

Figure 52.--Slimy sculpin, Cottus cognatus.

71. Cottus cognatus Richardson, slimy sculpin (fig. 52)
Slimy sculpins were caught in the colder streams of Lake Superior.

Records by state and county:
Michigan - Chippewa 1, 5, 9, 14; Luce 18, 19, 20; Alger 21, 28, 31; Marquette 40, 41, 46, 48, 51; Houghton 89; Keweenaw 125, 126; Ontonagon 94; Gogebic 114.
Wisconsin - Bayfield 144, 147, 151; Douglas 152, 154.
Minnesota - Lake 168; Cook 171, 172.

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